COMPARATIVE STUDY OF PRINT BASED GRAPHIC DESIGN FACILITIES IN SELECTED UNIVERSITIES AND THE GRAPHIC DESIGN INDUSTRY IN NIGERIA

BY

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A THESIS SUBMITTED TO THE SCHOOL OF POSTGRADUATE STUDIES, AHMADU BELLO UNIVERSITY, ZARIA, NIGERIA, IN PARTIAL FULFILLMENT
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Declaration

I declare that the work in the thesis entitled **"**Comparative Study of Print Based Graphic Design Facilities in Selected Universities and in Graphic Design Industries in Nigeria" has been carried out by me, in the Department of Industrial DesignAhmadu Bello University, Zaria, Nigeria under the supervision of Professor S. U. Dakyes and Dr. J. I. Azi. The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this dissertation has been previously presented for another degree or diploma at any university.

Maxwell Eshiwhobe ROBERTS _____ _____

Name of Student Signature Date

Certification

This thesis titled "COMPARATIVE STUDY OF PRINT BASED GRAPHIC DESIGN FACILITIES IN SELECTED UNIVERSITIES AND IN GRAPHIC DESIGN INDUSTRY IN NIGERIA" by Maxwell Eshiwhobe ROBERTS meets regulation governing the award of the degree of Master of Art in Industrial Design of Ahmadu Bello University, and is approved for its contribution to knowledge and literary presentation.

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Dedication

Of highest significance is my thankfulness to God who gave me continued strength during this programme of study and reminded me to have patience and keep the belief Him alone decides all things for a reason. This thesis is dedicated to my wife (Blessing), children (Zuriel and Othniella), lost relation that did not sustain the length of this journey, Cyprian, and to my mother, Constance who all differently inspired this work.

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Abbreviations

ASUU: Academic Staff Union of Universities

CTP: Computer to Plate.

DI: Direct Image

DTP: Desktop Publishing.

JAMB: Joint Admission Matriculation Board

PDF: Adobe Portable Document Format

SAV: Self adhesive vinyl.

UV: Ultraviolet

UI: User interface design refers to the individual layouts of pages.

UX: User experience design or the total experience of the user as they move through a website or application.

.

Operational Definition of Terms

Communication: A process by which information is exchanged between individuals through a common system of symbols, signs, or behavior.

Company: An organization which sells goods or services in order to make money.

Designer: One that creates and manufactures a new product style or design.

Digital: Relating to, or using calculation by numerical methods or by discrete units.

Digital avatar: An electronic image that represents and is manipulated by a computer user.

Environmental graphics: The aggregate of social and cultural conditions that influence the life of an individual or community by pictorial information.

Facilities: Something that makes an action, operation, or course of conduct, easier.

Graphic: Related to drawing or painting, writing and printing.

Industry: A distinct group of productive or profit-making enterprise

Interactive Board: A flat rectangular piece of material designed for a special purpose involving the actions or input of a user; being a two-way electronic communication system that involves a user's orders or responses.

Logo: An identifying statement.

Sign: A mark having a conventional meaning and used in place of words or to represent a complex notion.

Technology: A manner of accomplishing a task esp. using technical processes, methods, or knowledge.

Ultraviolet: Relating to, producing, or employing ultraviolet radiation.

Way finding: The course traveled from one place to another by studying signs.

Web design: One that creates and manufactures a new product style or design.

Abstract

The purpose of the study was to comparePrint based graphic design facilities in selected universities and thegraphic design industry in Nigeria, as it relates to promote the impacting of productive knowledge among professionals in the universities and Print based graphic design industry, by ensuring that the right facilities are made available in Nigerian public universities. This is in line with the expectation that design schools in the 21th century, should be equipped for the modern world, so that students are sufficiently prepared for inclusive participation in the Nigeria Print industry. The study however, went further to understandwhy graduates have to undergo re-training programme after graduation to fit into the production line,similarly why students are often rejected by companies when posted for Students Industrial Work Experience Scheme (SIWES). This study examines and explains the relationship between public universities and Print based design industry in Nigeria. The following objectives were considered (i) examine the availability of print based facilities in public universities. (ii) compare the teaching facilities in selected Nigerian universities and those of the print-based industry (iii) determine the level of collaboration between print-based industry and public universities in Nigeria. Descriptive survey method and percentage analysis were employed for the study, Primary data were gathered from the field in 4 federaluniversities which are; Ahmadu Bello University, Zaria; AbubakarTafawaBalewa University, Bauchi; Federal University of Technology, Akure andModibboAdama University of Technology, Yola. The 8printing companiesas well are; Excell Global printers Ltd and Unique – Ace Integrated Ltd, in Kaduna. ATBU ATIL printing Press and Ramadan Press, In Bauchi, in YolaAbtiPress

and Microtrend Digital Prints and lastly, in Akure Flamingos Digital prints and Signal 7000 digital. The sample size was among 10 graphic design lecturers, 50 final year undergraduate students,11 graphic design graduate staff and*8* supervisorsworking in the Print graphicdesign indusry.Findings from the study show that the Print-based designindustry has state-of the-art printing facilities andalso existing gap in the level of collaboration between public universities and Print-based design industry.Technological-enabled education programme is the key to fundamental, wide-ranging educational reforms. Consequently, Industrial Design institutions in Nigeria should assume a leadership role in the transformation of education in the swirl of rapid technological changes. Accordingly, for Nigerian education to reap the full benefits of Technology in learning. This research endeavour have made a considerable stride in the understanding of the impact of Print based graphic design facilities in public universities in Nigeria towards producing a new caliber of students whose professional ability are very essential in a developing economy.Nigeria universities should re-invent themselves by working collaboratively with the industry to provide the skills relevant to students after graduation. Institutions and Industrial Design programme must provide the leadership for students and industries and model the new pedagogies and tools for learning through effective strategic plan. However, a successful and effective strategic plan depends to the extent to which proper implementation and monitoring are carried

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Education is playing a major role for the progress of individuals and societies, changes in both technology and commerce encourage new approaches to learning and teaching. Around the world, the level of educational personalisation and diversity of possible educational environments is increasing. New devices, analytical approaches and tools, instrumentation of the learning process, and digital blended learning are all continuing to change traditional educational models and improve educational successes (Browse, 2015). Following this logic, trainees need be exposed to hands-on training through intensive use of modern printing facilities that are found in the printing industry. Printing companies globally have adopted digital technologies to streamline and redefine their print operations. Different forms of automated print equipment like computer-to-plate, direct imaging presses and other publishing devices have become regular features in the printing industry. It was in line with this development in the printing industry that Rochester Institute of Technology (RIT) has re-invented itself to provide the skills needed for a new generation of publishing and promotion professionals.

Pandit (2008) raised the issue of the increasing reliance of the printing industry on work-based training in the United Kingdom, thus leading to a fall in the demand for classroom-based training. London College of Communication had to respond by redefining printing education to be much more than printing craft and processes. This cannot be compared with what is on ground in some of the Industrial design departments in Nigerian universities the

Heidelberg letterpress printing machine,whichaccording to Fuller (2012) that the Heidelberg letterpress printing machine is presently on display as a museum artifact in the RIT New York. In RIT there is an exciting workshop series every semester, where students are requested to make suggestions on topics (software and curriculum trends in use) that would enhance the curriculum at the beginning of every semester. It was observed that students have sound network and can interact easily with their peers in other institutions.

Anecdotal evidences have shown that Nigerian universities are facing tremendous pressure from very dramatic forces that include;shifting population demographics, the deteriorating condition of Nigerian educational system and rapid technological changes are challenging Nigerian's long held educational glory. In response to which stakeholders in education (Government, Administrators, Educators, Parents and Students) are striving to determine how twenty-first century educational facilities should be; respond to the needs of learners, and interact with the community. The emergence and impact of digital technologies have further played a crucial role in transforming the printing industry in Nigeria from a manufacturing industry to a service industry, as many downstream sectors have demanded graphic design services to streamline their digital and print brand presence. In response, many graphic designers have expanded their product portfolios to include more interactive media design, as revitalization in many downstream markets such as healthcare, telecommunication, education, technology and financial services suggest the demand for graphic design services. This by extension brings about development in the graphic design industry.

These developments, when combined, have enormous bearings on the type and quality of training required in developing workforce for the printing industry (Afolabi, 2014). The competence of printing education is a vital factor in this situation, a new age of printing where greater competence and expertise are required to control and manage technologies as well as meet the needs of client. The universities in Nigeria, on the other hand, have been experiencing massive enrolment into various industrial design programmes. As such, learning can be carried out more effectively with appropriate facilities of providing knowledge. Adewumi (2002) posits that some available facilities found in universities for problem solving have become obsolete for teaching and learning. This has created vacuum in the learning process and the need to explore current trends in the contemporary practice, where technology is now permeating the educational system as a tool for effective teaching and learning (Oshinaiko&Adekunmisi, 2012). In view of this, both graduates and undergraduates that did not or have not acquired training with the contemporary practicing trends in terms of facilities in printing can hardly be of relevance in the printing industry in Nigeria.

Mac-Ikemenjima (2005) opines that in a complex society like Nigeria, many factors affect the use of technology and its integration, so an interdisciplinary and integrated approach is very necessary to ensure the successful development of Nigeria's economy and society. As engaged with current debates and developments in today's printing profession, it is apprehensive that there is little or no collaboration between the universities and the print industry. However, to improve the quality of education in schools, the researcher is of the view for the adoption of functional context approach to learning in industrial design

departments, where transfer of learning from the classroom to the "real world" will be enhanced.

1.2 Statement of Problem

Collins, Holum and Brown (1991) are of the view that too little attention is paid to the reasoning and strategies that experts employ when they acquire knowledge or put it to work to solve complex or real-life situation. As a result, conceptual and problem-solving knowledge acquired in school remains largely inert for many students. This lends credence for a new epistemology for learning, one that lay emphasis on active perception over concepts and representation.As such, it is deduced that;

1. Knowledge needs to be presented in an authentic context, i.e., settings and applications that would normally involve that knowledge.

2. Learning requires social interaction and collaboration.

Sequent to the analogy of the above theories, it could be inferred that, the presence of technology alone will not stimulate significant changes in enhancing the knowledge quality of students without their involvement. Most students may wish to take advantage of the available benefit of technology on their own; but a key concern is the question of whether these state- of the- art print-based graphic design learning facilities are readily on ground or not in public universities. This goes to explain why graduates have to undergo re-training programme after graduation to fit into the production line as significant changes are continuing in the industry, thus demanding a skilled workforce with up-to-date technical competencies (Afolabi, 2014); and why students are often rejected by companies when posted for Students Industrial Work Experience Scheme (SIWES). Therefore, this

study is embarked upon to bridge the gap; this will be done through a comparative study of the print-based graphic design facilities in public universities and those found in the print-based industries in Nigeria to understand the interface between training and industry.

1.3Justification of the Study

The quest by print-based graphic design industry for universities to produce graduates with marketable skills, in the fusion of the obsolete nature of the teaching and learning facilities which has been recorgnised for long by scholars like Adewumi, but the printing aspect has not been thoroughly explored and documented hence the need, to explore dynamics surrounding lingering evidence that the Nigerian education sector especially the university system produces graduates that do not meet the need of the labour market (Olaiya, 2011).

These claims need to be reviewed in the research.

1.4 Aim of the Study

The aim of the study is to compare print based graphic design facilities in selected universities and graphic design industry in Nigeria.

To achieve the aim of the study the following objectives are out lined.

1.5 Objectivesof the Study to;

(i) examine the availability of print based facilities in public universities.

(ii) compare the teaching facilities in some selected Nigerian universities and those of the print-based industry.

(iii) determine the level of collaboration between print-based industry and public universities in Nigeria.

1.6 Research Questions

To achieve the above objectives the following research questions were formulated for the study:

(i) whatare the available facilities in the printing sections Nigerian universities?

(ii) what is the gap between teaching facilities in some selected Nigeria universities and those of the print-based industry?

(iii) what is the level of collaboration between print-based industry and public universities in Nigeria?

1.7 **Significance of the Study**

The study on **"Comparative Study of Print-based graphic Design Facilities in Selected Universities and Graphic Design Industry in Nigeria"** Is significant in several ways;such asfocusing primarily on facilities (equipment and materials) of international standard, since we are in an era where technology is the play of the day and the bedrock of any nation's economy. This study ensures greater diversity of graphic design solution particularly with the use of relevant modern facilities, equipment, ideas and materials and also significant in its contribution towards the enhancement of notable transformation process that the profuse use of adequate facilities in public universities promotes.

Expanding the frontiers of graphic design practice will be enormous, when the level of collaboration between design industries and public universities in Nigeria is intensively pursued and serve as basis for developmental innovation in the graphic design community. The study will contribute to, by creating more job opportunities for many graduates that can meet the needs of the labour market, by exploring the creative potential and opportunities in the use of Industry's printing facilities, standard equipment and software packages, This study will be an additional source of literature relating to the subject area of the study, by improving on the available related literature on graphic design facilities available in public universities in Nigeria.

1.8 Scope of the Study

The study was focused on the availability of print-base graphic designfacilities in some Nigerian public universities and selected print-base graphic design companies. It includes the types of facilities, quality and availability of equipment and materials. The public universities are Ahmadu Bello University, Zaria; AbubakarTafawaBalewa University, Bauchi; Federal University of Technology, Akure; and ModibboAdama University of Technology, Yola. However, the study is delimited to undergraduate students of the above mentioned schools. Two print-base graphic design companies were considered from each of the states where these design schools are located. They are: Excell Global printers Ltd and Unique – Ace Integrated Ltd, in Kaduna. ATBU ATIL printing Press and Ramadan Press, In Bauchi, in Yola,Abti Press and Microtrend Digital Prints and lastly, in Akure Flamingos Digital prints and Signal 7000 digital. These companies were considered

because their printing facilities are contemporary standard efficient printing machines and have also employed graduates who studied graphic design.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter is devoted to the literature on graphic design practices and facilities in Nigeria public universities. The chapter begins with a review on the concept and nature of :

- **2.2 Graphic Design**
- **2.3 Who is a Designer?**
- **2.4 Stages of Production in print-based industry**
- **2.5 Printing by means of various technologies/ Techniques**
- **2.6 Software**
- **2.7 Facilities in the Universities**
- **2.8 Relationship between University and Industry**
- **2.9 Functional Context Theory**
- **2.10 Brief History of Printing in Nigeria**
- **2.10.1The Digitalization of Print in Nigeria**
- **2.11 Theories of Entrepreneurship**

2.2 Graphic Design

The development of this creative practice as a profession is fairly recent; it can be traced into antiquity to places like China, Egypt, Greece, and Rome where illustrated manuscripts were made (Encyclopædia Britannica, 2014). Early manuscript designers were not consciously creating "graphic designs," they worked to create a blend of text and image that was at once harmonious and effective at conveying the idea of the manuscript. The ancient Egyptian *Book of the Dead,* (plate I)which contained texts intended to aid the deceased in the afterlife, is an outstanding example of early graphic design where words and pictures are unified into a cohesive whole. Hollis (1994) begins his chronology in the late 1900s with the development of the art poster and its associated printing technologies. In contrast, Meggs (1998) locates the earliest origins of graphic design in the prehistoric cave paintings of Lascaux, (plate II)which has in its collections a painting of a bull and a horse, and also examines such epochal moments as the development of the alphabet, printing, and photography. However, William A. Dwiggins is commonly cited (Meggs 1998, Bierut et al. 1999, Soar 2002) as the person who actually coined the terms "graphic design" and "graphic designer" in a 1922 essay entitled *New Kind of Printing Calls for New Design* (Dwiggins, 1999).

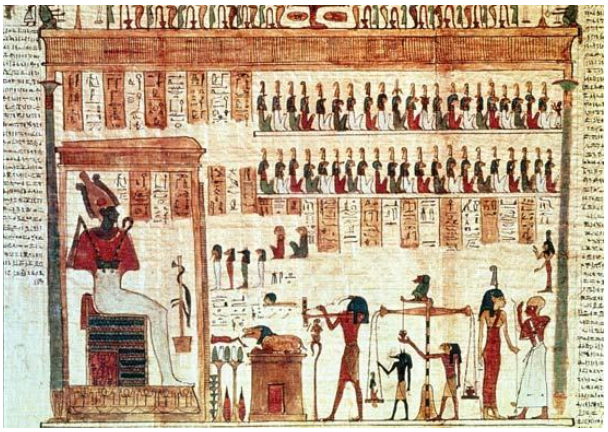


Plate: I Scene from the Egyptian Book of the Dead.
(Source: *Photos.com/Thinkstock)*

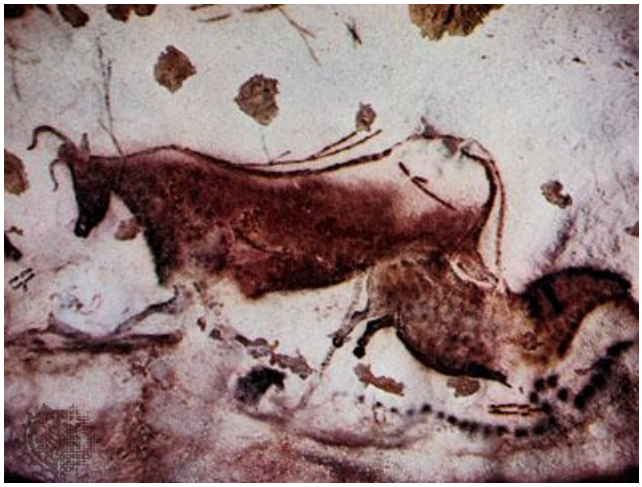


Plate: II A prehistoric cave painting of a bull and a horse of Lascaux
(Source: *Photos.com/Thinkstock)*

Encyclopædiabritannica (2014) defines graphic design as the art and profession of selecting and arranging visual elements such as typography, images, symbols, and colours to convey a message to an audience. Sometimes it is called "visual communications," a term that emphasises its function of giving form e.g., the design of a book, advertisement, logo, and Web site. Similarly graphic design is the profession that plans and executes the design of visual communication according to the needs of audiences and in the situation for which communication is intended (AIGA, 2015). It is connected throughout history to

writing, printing and publishing, graphic design is a creative process that begins with a message, in the hands of an experienced graphic or communication designer, is transformed into visual communication that transcends words, by controlling colour, type, images and ideas, the designer creates and manages the production of materials which convey the message to an intended audience (SGDC, 2015). As Jessica Helfand maintains:

> In contemporary culture, graphic design is the generic term for the multidisciplinary practice of combining typography, images and, increasingly, some combination of media for the purpose of informing, instructing or persuading a given audience to do something. Graphic designers both conceive of such methods of persuasion and, to varying degrees, execute them. As emissaries of communication, they visualize solutions for the presentation of abstract data, turning ideas into things: They create books and magazines, posters and packaging, exhibitions and Web sites, logos and film titles. (Helfand2001)

graphic design is a planned and articulated visual endeavour by a designer with the principles of design to communicate to a particular audience with clarity of content being emphasised.

An important part of the designer's task is to combine visual and verbal elements into a well-arranged and effective whole. Graphic design is therefore a two-way discipline: writers produce words and photographers and illustrators create images that the designer incorporates into a complete visual communication. The development of graphic design as a profession has been closely associated to high-tech innovations, societal needs, and the visual imagination of practitioners. Graphic design has been practiced in various forms throughout history, as printing and book production developed in the 15th century, advances in graphic design developed alongside it over subsequent centuries. In the late 19th century, graphic design developed as a distinct profession in the West, as a result of

the job specialization process that occurred there, and in part because of the new technologies and commercial possibilities brought about by the *Industrial Revolution*. Increasingly, over the course of the late 19th and the early 20th centuries, advertising agencies, book publishers, and magazines hired art directors who organized all visual elements of the communication and brought them into a harmonious whole, creating an expression appropriate to the content.

People's increasing sensitivity to environment have resulted in larger and larger markets demanding better design (Bernard cited in Walter 2015), this has propelled companies in the design industry to plan, design and manage the production of visual communication in order to convey specific messages, clarify complex information or project visual identities. These services can include the design of printed materials, point of-sale displays, packaging and corporate identification.

Industry products; are static design, motion and interactive design, consulting and image storage, commercial and independent (government owned) design services. Industry activities;graphic art, visual communication, corporate identification (i.e. logo), creating illustrations and Medical illustration. The design experience can take place in an instant or over a long period of time. The work can be at any scale, from a single postage stamp to the sprawling and interlinked digital and physical content of a newspaper. It can also be for any purpose, commercial, educational, cultural, or political.

Woods, (2007) posits that graphic design as it is todaywas first known as commercial art and a skill-based career where until the commercial success of Toulouse-Lautrec and

Mucha at the turn of the century, practitioners consisted of penniless or failed fine artists. The traditional path was to serve an apprenticeship and learn the craft of image making and production.The first unified approach to design education began with the Bauhaus founded in 1919 by Walter Gropius, where "*for the first time the total human environment was regarded as an objective of design"* (Bonsiepe 1965 cited bierutHeifand et al 1999).The primary ideal of this school was humanization of design, which included architecture, product and graphic disciplines. These were rooted in Gastalt theory of the visual environment, where the aesthetic would be driven by the purpose and need of the article which results to the famous maxim; *function over form'.*

However, the world and global attitude have changed dramatically since the 1920's and Bauhaus' heyday of the 1930's. Humanity has become vastly more commercial, more global and more instantaneous. That is the number of products people buy and sell. The number of markets, brand awareness; the amount of design seen in advertisements, architecture, fashion, products, and interiors have all increased exponentially in the last century. We see far more than the public of the Bauhaus era. Furthermore with the cessation of border formalities in many parts of the world, people are more aware of the world as a whole; politics, history, customs visuality and so on. This has been further enhanced by the internet which allows the world to communicate instantly and theoretically without censorship. Survey shows that development of affordable technology (software, cameras, and computers) in the last decade has encouraged people to become their own authors for almost any aspect of their lives, communication design inclusive.

Communication design is described as the transmission of ideas and information in forms that can be read or looked upon. Graphic designs essentially rely on vision and are mostly expressed with two dimensional images such as: signs, typography, drawing, graphic design, pictures, graphs, charts, colour, illustration and electronic resources (Sless, 1981). Wolman (1973) defines graphic design as the use of symbols to create and uphold organisational images, missions and values. While Sale (2010) observed that communication design is a common process whereby one system influences another system through the parameter of the transmitted signals. However graphic design may be viewed, it predominantly denotes the physiology of sight, perception, communication patterns and graphic designtheory. Graphic design also explores the idea that a visual message accompanying text has a greater power to inform, educate, or induce person or audience. Similarly, Dakyes (1999) observes that exchange of meanings through words and pictures register better than through words alone.

While Lidwell (2003) further confirms this assertion by upholding that memory for pictures and words together are superior to memory for words alone or pictures alone. The role of graphic designs is critical in attaining all-out organisational success. Sale explains that communications have always been one of the most imperative strategies for attaining organisational success. Continually improving on organisational communications would give any organisation an edge in today's information and communication age.

Cezzar (2007) postulates that graphic designers in the new communication age are responsible for interactive designs where the content is fluid, sometimes changing minute to

minute, as well as interfaces that help users navigate through complex digital experiences. This work differentiates itself by adding another element: responding to the actions of the viewer. Editorial design for web and mobile is the most tangible example of content-driven work in this area, including publication websites, mobile apps, and blogs. Some design involves the presentation of streaming information, also known as data visualization.

Other designers work on digital products, which are digital services or platforms that can be brought to market. Product design for web and mobile is related to software design. Sometimes different designers work on the user interface design (UI), which mostly refers to the individual layouts of pages, and the user experience design (UX), or the total experience of the user as they move through a website or app.

2.3 Who is a Designer?

To examine the role of a graphic designer today, the answer to this is largely dependent on who is asking the question and their underling motives. From printing employers they are concerned with technical expertise; academics are more concerned with scholarly research and writing. Likewise, the advertising and marketing employer's perspectives place emphasis on concept, while Clients commonly believe that designers are concerned only with the finished, visually attractive product, and often peers too concentrate on this aspect more than any other. In truth designer are essentially problem solvers. Whether it is a problem as mundane as trying to fit one and a half pages worth of text onto one without resulting in a squashed outcome or finding the most appropriate vehicle for business

promotion; website or leaflets. In other words, a graphic designer needs to be a critical and inventive thinker. Helfand et al made the following observations:

> There are designers and designers. I would suggest that the designer with a capital D, the kind of designer talked about, is hired because he gives to everything he touches a fresh, new feel. He approaches problems differently… if the problem is presented to him, and he is given an opportunity to work it out in his own way, a great many things can be accomplished. You can either tell him exactly what you want, in the way of feeling, objective, etcetera, or you can let him employ his skills and imagination without precise or specific limitation. (Lustig 1954 cited Bierut, Helfand et al 1999)

In support of this, Gau (2017) opines that a graphic designer is a professional within the graphic arts industry who assembles together images and typography to create graphics primarily for published, printed, or electronic media such as brochures, advertising, illustrations, user interfaces, and website design. It is so pertinent to design; creativity does not come instantly while looking at a blank page. It must be worked at, thought and researched. Graphic designers are creative individuals who produce artworks and page layouts for reproduction in print and electronic media such as magazines, newspapers, books and websites, and for corporate identity programs and advertising campaigns. An example is the popular U.S. symbol "Uncle Sam," (plate III)usually associated with a cartoon figure having long white hair and chin whiskers and dressed in a swallow-tailed coat, vest, tall hat, and striped trousers, a familiar piece in the 20th century shown in James Montgomery Flagg's World War I recruiting poster, also used in World War II, for which the caption read, "I Want You."



Plate: III Army recruiting poster featuring "Uncle Sam," 1917.
(Source:*James Montgomery Flagg- Leslie-Judge Co., N.Y.)*

Graphic designer may work as team members in design studios or advertising agencies, or alone undertaking consultancy or freelance work. A graphic designer is responsible for arranging and using elements on different types of media (such as a website, a package or a poster), with the use of a graphic software program such as Adobe Illustrator, Photoshop and InDesign. These elements include: Photographs, Illustrations, Type, and Shapes, Colour, Texture. Graphic designers apply what they have learned about physical, cognitive, social, and cultural human factors to communication planning and the creation of appropriate form that interprets, informs, instructs, and persuades. Graphic designers use various technologies as means for creating visual form and as an environment through which communication takes place. Graphic designers plan, analyze, create, and evaluate visual solutions to communication problems. Their work ranges from the development of strategies to solve large-scale communication problems, to the design of effective

communication products, such as publications, computer programs, packaging, exhibits, and signage (Sääksjärvi&Hellén, 2013). Depending on the scale of the context in which a designer works, the work may include one, some, or all of these things in the course of a year. Larger companies, agencies, teams, or studios may lean towards specialization, while smaller studios and groups may need to have each individual capable, if not an expert, in multiple areas.

2.4 Stages of Production in print-based Industry

The main activity carried out in graphic design printing presses and workshops is printing. Gau (2017) defines printing as the art of reproducing any type of text or illustration in order to create many copies. The production process carried out in this type of industrial establishment is as follows:

2.4.1 Prepress

Prepress as observed by Gau (2017)is a term used in the printing industry to describe the process a document must go through before it can be printed. It is essentially the processes and procedures that occur between the creation of a print layout and the final printing. It can represent the preparation of digital files for printing and comes after the design and page layout stage. It can also represent those steps needed to transform the original copy (mechanical or digital file) into the printing plates or other forms needed for reproduction.

In support of this, Glazer (2010) opines that prepress refers to all the print production functions that take place from the time the printing company receives the artwork from a graphic designer or customer up until the actual printing takes place on the printing press.

These processes and procedures include camera-ready work, color separating, stripping, plate-making, scanning, film production, digital prepress instruction, receiving media files or downloading them from the web; creating a "proof" for client approval; making any changes requested by the client; creating negatives; and finally making the plates that will be used on the press and other prepress functions performed by the printer, separator, or a service bureau prior to printing.

This phase includes the photomechanical printing (printing procedure obtained from negatives of photographic images) performed in the dark room. In photomechanical printing, photolithographs are used, which are positive films that initiate the offset printing process and act as a replacement for the negative. In short, photomechanical printing is the process of separating the four basic colours (cyan, magenta, yellow, and black), with each one having a percentage. This process obtains four positives, a different one for each colour, and a colour proof that will subsequently be used in the printing process.

The colour proofs are printing simulations obtained from the photolithographs. This type of proof is very accurate and reliable, as it is derived from the same photolithographs that are subsequently used in the printing press. There is now a more modern technology called CTP (Computer to Plate), which circumvents the need to obtain photolithographs, thus enormously improving the production process, as printing error corrections can be made directly on the computer.

2.4.2 Press

Printing with regard to "print production" is the mechanical process of applying ink to paper using a printing press. The printing press is the most cost effective way of producing

large volumes of printed materials due to its speed and the lower cost of paper. With the rapid improvement of office printing and high speed photocopying technology many companies will refer to the in-house production of large quantities of colour copies or large-format prints as their “print production.”

When a printing plate is made, the printing image is rendered grease-receptive and water-repellent, while the non-printing areas are rendered water-receptive and ink-repellent. On the press, the plate is mounted onto the plate cylinder which, as it rotates, comes in contact with rollers wet with water (or dampening solution) and rollers wet with ink. The dampening solution wets the nonprinting areas and prevents the ink from penetrating these areas. The ink wets the image areas, which are transferred to the intermediate blanket cylinder. The paper picks up the image as it passes between the blanket cylinder and the impression cylinder.

While this process involves primarily one machine, there are many areas of concern.

To ensure high quality printing the printer must:

- Match the ink color specified
- Control dot gain
- Minimize paper movement
- Minimize image distortion or noise such as dust & heckles.
- Check that the pages back each other correctly.
- Evaluate halftone quality and attempt to hold the highlight & shadow detail.

2.4.3Finishing

After a job is printed it always goes to a bindery stage, this stage can include one or many steps depending on the end product: cutting or trimming, folding, laminating, scoring, perforating, stitching, perfect binding, spiral or plastic comb binding, and hardback bookbinding. The final work are very variable with regard to type and format of the finished products, and can be classified as follows: publications (e.g. books, magazines, newspapers), advertising (e.g. labels, posters, catalogues), and sundries (e.g. calendars, stamps, tickets, business cards). The finishing stage includes packaging for delivery. A small job might be shrink wrapped; stacks of magazines are often strapped together so an entire stack can be picked up easily; and larger jobs can be boxed or crated, generally requiring a forklift to move them from the delivery truck.

2.5 Printing by means of various technologies/ Techniques

The technologies/Techniques in printing are based on several innovations over the years. These form the basis upon which printing is anchored. Different technologies/Techniques exist because of the different need of the society that has to be addressed and improved on propounded these innovations. Among thesetechnologies/Techniques are;

2.5.1 Planographic Printing (offset lithographic)

The offset system is based on the indirect printing procedure whereby the paper is run through an intermediate rubber roller*(figure1).* The offset is based on the physical principle of water-oil repulsion (immiscibility), hence the use of oil-based and water-based inks in this method. The printing elements accept oily ink and reject water, and the blank spaces

reject the ink and accept the water. The offset system is the most widely used system in graphic design workshops because of the combination of good quality and savings.

Offset printing consists of the following types:

• *Offset typography*: With typographic mould

• *Offset lithography*: With a lithographic mould

• *Offset rotogravure (or offset chalcography)*: With arotogravuremould

Printing machines with the offset system may use one or more colours. This printing system can be used with paper sheets or reels, in the latter case being fitted with a cutter and folder. Depending on specific production needs, the offset run can be combined with other graphic-arts methods. Planographic or lithographic printing tends to use solvent-based inks (i.e. not waterbased), although solvent-free preparations are rapidly becoming more common.

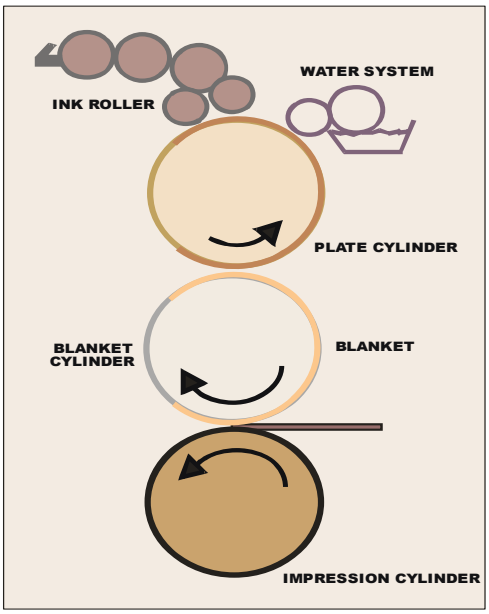


***Figure 1.*Lithographic**
"Oil and water don't mix"
(Source: Illustration by Maxwell E. Roberts 2016)

2.5.2 Relief Printing (Typographicaland Flexography)

This technology is based on producing images, generally letters or figures, elevated in relation to a background or non-printing area*(figure2)*. The ink is applied to the elevated parts, which are then brought into contact with the paper or medium receiving the image. There are several ways of creating the relief image, such as letter-by-letter composition using movable type (linotype), or with text formed by mechanical procedures. These technologies are suitable for simple and quick printing jobs. The inks commonly used in these methods are water-based or solvent-based. New inks that dry by means of ultraviolet (UV) light curing or with the use of other physico-chemical agents are being researched and applied. Machines that use this technology are called "platen presses", which print sheets of paper by means of two flat elements (the platen, where the mould goes, and the bed, where the sheet to be printed is placed) which press against each other.

Other machines used are die-cutting presses, which cut, emboss, and score by means of two flat elements, the platen and the bed, by exerting pressure on the working material. The material worked by the die-cutting machines is paper, card, rubber, plastic, and other similar materials. The cutter is fitted to the platen and the material to be cut is placed on the bed.

Printing with flexible plates and fluid inks that dry by means of evaporation is called flexography. This is a direct system, as the flexographic plate, once inked, transfers the ink straight to the medium. Therefore, when looking at this plate, the image text reads backwards so that the printed medium is read correctly. The plates have a relief area that prints directly onto the substrate with light pressure known as "kiss pressure". Unlike the heavy metal plates used in the offset printing system, flexographic plates are adaptable and

portable. The risk of fire in flexographic rotary presses is somewhat less, due to the low working speed. Many pocket books are printed using the flexographic procedure. This printing system is widely used in packaging, particularly tetrapacks.



Plate: IV Flexographic printing
(Source:Safety guide graphic-arts printing presses and workshops)

2.5.3 Intaglio (Rotogravure)

In rotogravure technologies, the image is cut into the surface of an engraved plate or cylinder*(figure 3)*. The plate is bathed in ink and the excess is removed with a blade. It is then brought into contact with the paper or medium in question in order to transfer the image.

This technology is suitable for publications requiring long print runs, such as newspapers and packaging materials. Solvent-based inks are usually used for this purpose, most commonly toluene, which is a highly flammable product (flashpoint 4 ºC), and the vapour/air mixtures are explosive.

There are two types of rotogravure: sheet or reel. The former is used for books and high-quality photographs, while the reel type is used for long magazine or catalogue print runs. Chalcography is derived from rotogravure. This process is used for printing by means of

chalcography presses with copper or zinc plates. The printing forms may be manual (wood engraving) or achieved by means of chemical incisions (etching, aquatint).

Chalcographic forms may be:

• Flat: These are obtained by manual or chemical engraving, and are used in chalcographic printing with thick oily inks.

• Cylindrical: These are cylinders with a copper electrolytic layer engraved using the rotogravure procedures.

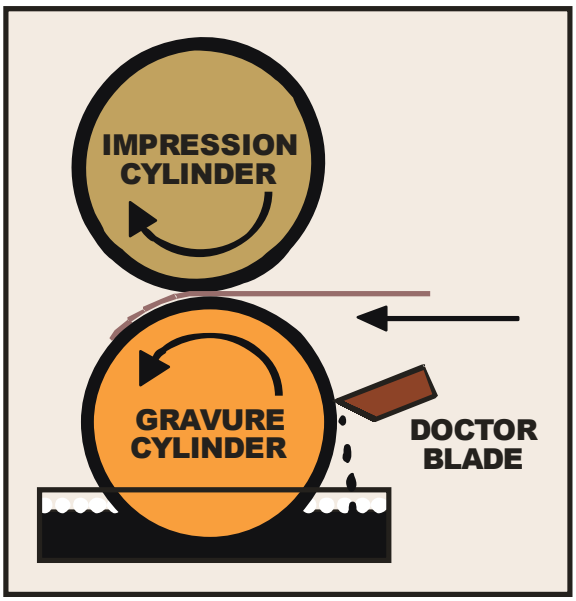


Figure 2. **Gravure**
Etched image areas form reservoirs to receive ink
(Source: Illustration by Maxwell E. Roberts 2016)

2.5.4Stencil (Screen printing)

Screen printing makes use of a text image mounted on a fine-mesh screen. The ink is applied to the open areas of the screen and is pressed with a scraper on the open parts and the stenciling. The ink thus passes through the open parts and is applied to the medium beneath the mesh. Screen printing is very often used in simple jobs and short print runs,

such as printing on fabrics, posters, presentation materials, and wallpaper. Screen printing uses solvent- or water-based inks; the choice depends on the printed medium. As the screen-print covering is usually thicker than normal, the inks are also more viscous than in other printing technologies.

This printing technology is widely used in advertising. It may take one of two forms according to the printing surface: flat or cylindrical. The flat type prints a range of sizes from small formats to advertising panels, posters, etc. The cylindrical type is used for decorating packs, bottles, etc.

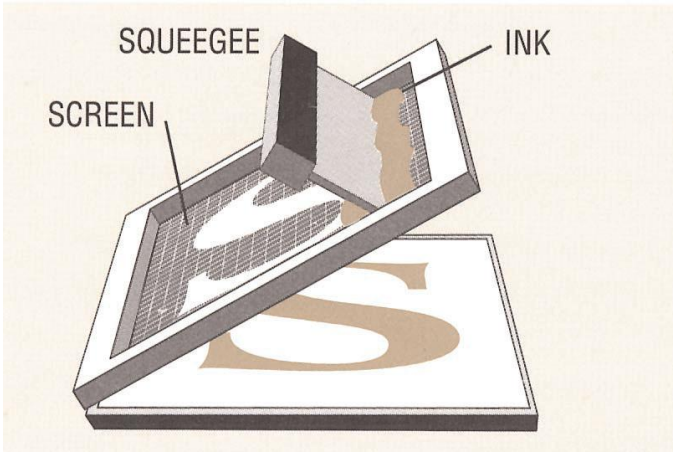


Figure 3. **Screen printingInk passes through image areas.**
(Source: Digital workflow production)

2.5.5Digital Printing

According to Gau (2017) digital printing is any type of a print reproduction method that uses electronic files to produce printed matter from spots and dots of ink, toner, or dye. Digital, unlike traditional print processes, is a direct to output device process; an image is created on the computer and transmitted directly to the output device. Similarly Singer (2001) posits that digital printing is also called “print on demand” or computer-to-plate

(CTP) which removes the need for special plates and prints directly to the printing machine. It is also is a fast option that is appropriate for small quantities. Short run, on-demand, variable information and Imaging from fully composed digital files direct to the press.

2.5.6Examples of digital printers

- Xeikon DCP-32, 50
- Indigo E-print 1000
- Agfa Chromapress
- Heidelberg GTO-DI
- Docutech 6180 and DocuColor 2060
- TR Systems MicroPress

2.5.7Examples of digital desktop printers

In some circumstances, may be the final output.

- Laser / Color Laser
- Ink Jet
- Dye Sublimation/Diffusion
- Phase Change
- Thermal Wax Transfer

2.6 Software

Software comprises the entire set of programs, procedures, and routines associated with the operation of a computer system. These are instructions that tell a computer what to do (Encyclopædia Britannica, 2014). Software program is a set of instructions that directs a computer's hardware to perform a task. The two main types of software are system software and application software. System software controls a computer's internal functioning, chiefly through an operating system. Macintosh or Windows operating systems are mostly preferred(STI Group, 2015). Operating system also controls such peripherals as monitors, printers, and storage devices. Application software, by contrast, directs the computer to execute commands given by the user and may be said to include any program that processes data for a user. Application software thus includes word processors, InDesign, PhotoShop and Illustrator and many other "applications."

Trifecta of InDesign, PhotoShop and Illustrator are found in the Adobe suite of Creative Cloud applications. It is a graphic editing program developed and published by Adobe system incorporated. According to Sappi (2005) designers should prepare their design in the program that is best suited for the task. Illustrator is a drawing (vector) program, ideal for logos, packaging, posters and single-page layouts. Photoshop is a pixel-based (raster) program that lets a graphic designer size, color-correct and manipulates scanned images such as photographs and flat art. Neither is intended for multi-page documents. For that, use a page layout program such as QuarkXPress or InDesign.

Many InDesign users may primarily work on image heavy, single page documents such as flyers, office stationary, business cards, posters or advertisements. But if a designer is

laying out significant amounts of text for projects such as annual reports, directories, or even novel, the often-overlooked Story Editor in InDesign can be of significant use.

Colour corrections or manipulations, rely on the numerical color gauges in Photoshop rather than what is on the screen. colour calibrate your monitor and printer to reduce discrepancies. Sappi (2005) observes that, releasing files in PDF (Adobe Portable Document Format) has become increasingly popular in the publishing and advertising business because it provides a degree of standardization for materials printed in multiple locations and at different printers. This print ready format preserves all the fonts, formatting, graphics and colours of any source document, independent of the application and platform used to create it. This can easily be viewed on multiple platforms without losing quality.

2.7 Facilities in the Universities

A look at the situation in Nigeria's education system gives a sharp contrast to the pattern of innovative responses to change seen on the global platform. The gradual trend in information technology which has opened up various challenges in the practice of design most especially the training pattern of designers requires the need to adequately integrate designer's skills and knowledge with the current trends of technology (Hollis, 1994 and Dwiggins, 1999).A survey of the state of printing education by some researcher concluded that "the printing industry in Nigeria, in line with global trends, is passing through a phase of transformation that is driven by digital technologies. Expectedly, there has been an emergence of new business models. Therefore, the print media industry has witnessed the

expansion of traditional printing industry into a wide range of related areas like management, communication design, and marketing and information technology. Consequently, there is an urgent need to ensure that training opportunities in Nigeria's graphic design schools meet up with industry needs." (Afolabi and Jimoh, 2014).

Drucker (1997) cited in Marmolejo (2007) helped us to recognize that while higher education is becoming a dynamic, global enterprise, the strategic management of higher education facilities is becoming increasingly complex. He astonished many in 1997 when he suggested that "universities won't survive" and argued that "today's (university) buildings are hopelessly unsuited and totally unneeded" Drucker was perhaps exaggerating with this prediction since universities are still around and continue to grow. Not surprisingly, in a recent study conducted, an increasing number of higher education leaders identify the challenges associated with "aging and expanding facilities" as one of the top change drivers in the field, exceeded only by insufficient financial resources, technological change and changing student demographics. In the same report, "insufficient facilities" are also considered among the top threats to the success of higher education. The study concludes with a call to action and the recognition that leadership is "a key ingredient that will ensure higher education's future success and help mitigate its threats" (Marmolejo, 2007).

According to the Association of Higher Education Facilities Officers in the United States, among critical issues the higher education facilities faces there is no question that, confronted with the changing needs and means for delivering education, institutional

planners and managers need to reconsider the way higher education facilities are designed, planned and managed. In the same vein,Adewumi (2002) holds that, some available design facilities found in some public universities in Nigeria meant for design problem solving have become obsolete for teaching and learning. Hence there is need, for a Paradigm Shift the move to align Nigeria's education system with global standards will naturally lead to the extension of frontiers.

TVET (2007) further confirms this assertion by maintaining that vocational education and training alone does not provide jobs or eradicate poverty. Good government policies do both. In harmonizing both statements, an argument can be raise that governments should create an economic environment that promotes the growth of enterprises and generally stimulates the economy. When businesses develop and expand, additional labour-market demand for university graduate will emerge, new job opportunities are created, more people get employed, and the incidence of poverty reduces. For this to happen on a sustainable basis, however, the graduate must be labour-market relevant, equitable, efficient, and of high quality. Can the present graphic design facilities in public universities provide the framework for the implementation of such?

Similarly, the poor conditions of the physical infrastructure in tertiary institutions in Nigeria were vividly captured in the report of the Needs Assessment Committee, and Othman (2016) identified some physical infrastructure for teaching and learning as follow; Lecture Theatres/ Auditoria, Classrooms, Laboratories Workshops/Studios, Libraries and staff Offices. The learning resources were identified as laboratory equipment and

consumables, ICT facilities and services, books, journals and periodicals, machines and other research equipment. Othman puts it that,

> A committee was set up by the Federal Government to assess needs of Nigerian public Universities as part of agreement between the government and the Academic Staff Union of Universities (ASUU) for the union to suspend its industrial action in 2013. The committee includes representative of all the stakeholders and was composed of individuals with high level of integrity in the society.

Othman (Ibid) holds that the committee's assignment covered 61 public Universities across the country (27 Federal owned universities and 34 state owned) at the time when there were a total of 74 public universities in the country. The committee reported that physical facilities for teaching and learning in Nigerian Universities were inadequate; they were being used beyond the original carrying capacity. Most of the workshops/studios were poorly furnished and equipped and were overstretched or overcrowded. The committee further found out that basic learning resources were unavailable or in short supply. The committee provided proof to support their assessment. For instance less than 20 percent of the universities used Interactive Boards; even the ones that used such Boards were using them in less than 10 percent of their lecture rooms/ theatres. Internet services were almost non-existent in some universities, or epileptic and very slow when accessing. No university library was found to be fully automated while 35 percent of the libraries were partially automated. Othman concluded that consequently, three years after this report and release of the fund, the situation has not changed significantly in most of the universities.

The prominence of facilities in the realization of educational objectives and development of required workforce for the 21st century has been a dominant issue for researcher in recent time. This is premised on the fact that availability may most often than not lead to

integration (Jude and Dankaro, 2012). The apparent lack of facilities and resources in the institutions has led to lack of motivation for integration of same in instructional delivery (Ekukinam, 2002).

2.8 Relationship between University and Industry

As Hoy and Miskel reason, "Because schoolorganisations are conceptualized as part of a larger environment, an argument can bemade that anything that happens in the larger environment may affect the school and viceversa" (Hoy and Miskel, 1996). In other words, it has been recognised that the teaching and learning which occurs within an institution have a dynamicimpact on the larger environment in which the institution resides. Likewise, the dynamics ofthe larger environment impacts both on institution and the teaching and learningwhich occurs within that institution.

Following World War II, attempts to define organisationalbehaviour through interactions between the organisation and the environment emerged as a collection of ideas collectively known as open systems theories (Scott, 1998). Unlike closed system theories which attempt to define organisational structure and processes solely within the context of the organisation, open system frameworks attempt to define organisationalbehaviour through an examination of the organisation and the environment in which it resides (Scott, 1998). In open systems theories, organisations are perceived as being embedded in an environment, and import resources from the environment to export products and services to the environment. In drawing a conclusion with regard to schools as open systems, Hoy and Miskel argue that "the larger social, cultural, economic, demographic, political, and

technological trends all influence the internal operations of schools. This is because school organisations are conceptualised as part of a larger environment. An argument can therefore be made that anything that happens in the larger environment may affect the school and vice versa".

Among the different theoretical frameworks for open systems is the Resource Dependency Theory. The main premise of this theory is that no organisation is totally self-sufficient and must engage in exchanges within the external environment for necessary resources. The flow or exchange of resources creates dependencies and power differentials between organisations and the environments in which they reside. These power differentials have restraining effects on an organisation's actions (Johnson, 1996). There is never a time when this is more evident in an educational setting as when a school faces a notable shift in emphasis in terms of curriculum and aims, leaving a deficit on professional and industry skills, which will be blamed on a lack of interaction between industry and education.

Today, businesses are looking for innovative solutions from the universities to help meet their business needs of higher productivity and lower costs, yet increase efficiencies. In the area of talent, technical and management resources have to be strengthening as these are crucial to knowledge-based industries. A market-driven approach to higher education has to be fostered in order to encourage manpower development from the grassroot level. The idea is to involve the private sector in higher education (Raver, 2012). We have witnessed a lot of technological changes. These changes; however, have not been properly used by our graduates in order to compete in the present scenario. It is essential to have industry-university interactions which will help to impart relevant knowledge and will be

sustainable in the changing conditions. Industry and university have been at odds with each other for decades, with industry accusing university of being out of touch with reality and university accusing industry of being only after the money (Dave,2012).

It is important to engage rather than avoid corporate sectors in the field of education just as we engage government notwithstanding all the corruption charges against it. Yet most of academicians choose to engage it, they choose to be in their committees so that their voice is represented and they could influence its activities and policies positively. The same principle need to be applied while engaging corporate sector in the field of education. Projects carried out in collaboration with industry do not only provide finance but also have a positive effect on the performance of academicians in academic publications and in the number of patents granted (Kaymaz and Eryigit, 2011) Pricewaterhousecooper obverses that;

> Another crucial factor is that there is insufficient interface and interaction between educators of designer and employers of designers, regarding such areas as graduate in-take requirement; the appropriateness of course content to meet the changing needs of industry; student support and work placement; job placements etc. Criticism of design education relates to course content and scope, especially that many courses do not adequately reflect the needs of industry, and that greater emphasis needs to be placed on innovation and creativity in design, marketing skills, communication and strategic planning skills. (Pricewaterhousecooper& Enterprise Ireland, 1999:13)

With the lack of complimentary industry related skills that universities are faced with and the over production of design graduates, Woods (2007) stress a need for industry placement for real life experience, team and key skills and to broaden conceptual thinking in design education with an emphasis on the finished and technical aspects of the

professional practice. This is in addition to contextual studies which have been an obligatory aspect of design undergraduate studies for the last few decades; namely psychology, philosophy, sociology, law, language and history of art and design when it moved from being a craft based vocational area to a common liberal arts subject.

> Design management is also noted as area which warrants more attention, particularly within the context of degree and post-graduate courses. This is a field which will be in increasing demand in the future, as companies seek to engage professional design managers to manage all of their needs. While most design courses have some business-related subjects the need for students to further develop their business/commercial/ entrepreneurial skills within the context of a design course was emphasised. Increasingly, employers are seeking designers with sound commercial nous who can hit the ground running from a very early stage. (pricewaterhousecooper& Enterprise Ireland, 1999:92-93)

The debate centres around what should a design teaching and learning consists of and who should be the decision makers? On the basis of this report, both industry and education see the educational process as production for industry.

> An effective and coherent interface between establishments… is an area of considerable frustration for design educationalists, who are mindful of their responsibility in turning out design graduates whose skills are in keeping with the needs of industry, but currently have no mechanism to foster such a relationship. (pricewaterhousecooper& Enterprise Ireland, 1999:91)

Designers study Gestait and lateral thinking to foster creativity, research skills in order to create ideas. Grounding in history for the same reason, or as Manfrodotaufuri put it "*we are obliged to see history not as a great tank of codified values, but as an enormous collection of failed utopias, failures and betrayals"* (baljon, 2002). Critical analysis of historical work also teaches practitioners to be more critical and aware of their own design

processes. It is not difficult to say that designers should be up to date on software and technological practices.

2.9 Functional Context Theory

The functional context approach to learning stresses the importance of making learning relevant to the experience of learners and their work context. The learning of new information is facilitated by making it possible for the learner to relate it to knowledge already possessed and transform old knowledge into new knowledge. By using materials that the learner will use after training, transfer of learning from the classroom to the "real world" will be enhanced. The functional context theory was developed by Thomas Sticht in 1975, is considered a cognitive learning theory. The theory is based on the premise that students learn best when instruction is based on prior knowledge base, making use of long-term memory (Sticht, 1987). Instructional strategies must be developed that require students to make use of their language and problem solving skills (Sticht, 2000). Although the functional content theory is a cognitive theory, it is in direct opposition to other major components of cognitive theories that hold the premise that learning occurs in stages and is totally separate and apart from any environmental influence. Sticht stresses that learning has everything to do with a person's environmental influences.

Instead of developing in life's predetermined stages, instructional strategies must be developed that are based on their relevance to the students and their own personal experiences. Importantly, according to Sticht's functional context theory, learning is accomplished through the context of the students' activity, giving them the ability to transfer their classroom learning successfully to their daily work tasks. Function content

goes hand in hand with situated learning theory, which also is based on the premise that learning is best accomplished when it is based on the student's previous knowledge and current situation. Academic learning involves the learning of facts needed for school success, but functional learning involves learning skills directly related to a real world job situation.

2.9.1 Situated Learning

Collins, Brown and Newman introduced cognitive apprenticeship as an instructional model for situated learning comprising six teaching methods to support learning: modelling, coaching, scaffolding, articulation, reflection and exploration. Learning in a professional environment also helps students to understand the purposes and uses of their (new) knowledge (Collins et al. 1989). This type of learning can be defined as situated learning (Lave and Wenger 1991) because it is characterised by the important role of the (social) setting in which students learn to apply their knowledge. It is claimed that situated learning results in highly meaningful situated cognition and thereby enhances transfer of knowledge to new situations (Brown et al. 1989). Situated cognition is more powerful than decontextualised knowledge, which, like the theoretical knowledge students acquire in schools, is often represented in abstract structures and therefore difficult to translate to concrete situations (Orey and Nelson 1994).

The traditional model of learning in practical settings has been that of apprenticeship learning where students start by observing experts and are gradually given more tasks to perform as their competence grows. A drawback of this model is that learning is driven by the day-to-day demands of the workplace where learning opportunities and supervision do

not have first priority (Collins et al. 1989; Dornan 2006; Taylor and Care 1999). The changing printing environment and developing insights into learning and teaching in printing practice warrant new models and methods to provide the optimal learning experience for students during their undergraduate studies (Dornan 2006). In general, models for (print) teaching should be sufficiently specific to guide lecturers in their role as a printing teacher.

2.9.2 Cognitive Apprenticeship

Around 1987, Collins, Brown, and Newman developed six teaching methods modeling, coaching, scaffolding, articulation, reflection and exploration. These methods enable students to cognitive and metacognitive strategies for "using, managing, and discovering knowledge" (Collins et al. 1987).

2.9.3 Modeling

Experts (usually teachers or mentors) demonstrate a task explicitly. New students or novices build a conceptual model of the task at hand. For example, teacher might write out explicit steps and work through a problem aloud, demonstrating her heuristics and procedural knowledge.

2.9.4Coaching

During Coaching, the expert gives feedback and hints to the novice.

2.9.5 Scaffolding

Scaffolding the process of supporting students in their learning. Support structures are put into place. In some instances, the expert may have to help with aspects of the task that the student cannot do yet.

2.9.6 Articulation

McLellan describes articulation as (1) separating component knowledge and skills to learn them more effectively and, (2) more common verbalising or demonstrating knowledge and thinking processes in order to expose and clarify them. This process gets students to articulate their knowledge, reasoning, or problem-solving process in a domain". This may include inquiry teaching (Collins et al., 1988) in which teachers ask students a series of questions that allows them to refine and restate their learned knowledge and to form explicit conceptual models. Thinking aloud requires students to articulate their thoughts while solving problems. Students assuming a critical role monitor others in cooperative activities and draw conclusions based on the problem-solving activities.

2.9.7 Reflection

Reflection allows students to "compare their own problem-solving processes with those of an expert, another student, and ultimately, an internal cognitive model of expertise". A technique for reflection could be to examine the past performances of both expert and novice and to highlight similarities and differences. The goal of reflection is for students to look back and analyse their performances with a desire for understanding and improvement towards the behaviour of an expert.

2.9.8 Exploration

Exploration involves giving students room to problem solve on their own and teaching students' exploration strategies. The former requires the teacher to slowly withdraw the use of supports and scaffolds not only in problem solving methods, but problem setting methods as well. The latter requires the teacher to show students how to explore, research, and develop hypotheses. Exploration allows the student to frame interesting problems within the domain for themselves and then take the initiative to solve these problems.

2.10 Brief History of Printing in Nigeria

Two missionaries Hope Waddel, with the help of his assistant Samuel Edgerly, established the first printing press at Calabar in 1846, named The Hope Waddel Press in South Eastern Nigeria. This was used for the mass production of religious tracts and booklets. Similarly, Rev. Henry Townsend raised the bar when he established another press in the Western part of the country in 1854. Five years later he started a school of printing where he trained pupils at Abeokuta. Townsend started IweIrohin, the first newspaper in Nigeria. However the Mission Printing Press established by Townsend folded up in 1867 due to the cultural and political crisis that erupted between the Egba people and the European settlers.

According to Daramola (2006) prior to the collapse of Townsend's printing press, what can be regarded as an evolving printing industry had already taken root. This evolution can be attributed to a lot of factors. Firstly, the proliferation of missionary activities in Nigeria resulted in the setting up of presses which served as a means of publicising and propagating the different faiths.

Many of the missionaries came with their printing presses. Another attribute is the evolving and flourishing newspaper industry at the time which also stimulated the establishment of printing presses like some of those set up in 1862 by Robert Cambell, and the Caxton Printing Press established in 1875 by Richard Blaize, by the end of the 1880s, not less than five printing presses had been established in Lagos (Daramola, 2006). The quest for high quality printing is yet an attribute. This became the driving force behind the publishers' investment in efficient printing equipment. Thus, by 1910 modern and more efficient printing presses were established in Lagos. This made it possible for newspapers (the major markets for printing presses.) to avail themselves of a wide range of services (Echeruo, 1976).

Another vital influence on the fledging printing industry in Nigeria at the early period, aside from the missionaries and the newspaper publishers was the colonial government. The first Government Printing House was established at Broad Street, Lagos in 1914. It provided stationery materials to the Government. During the colonial era, four Government Press Offices were established at Enugu, Ibadan, Cameroon and Lagos. It had initial staff strength of less than two hundred. However, by 1933, the production capacity of the press had improved greatly. Production later included Trade Journals, Letter of Credence, White Papers, Rules and Regulations, Treasury Books and Forms. Consequent upon this, the department became a very important body in Government; hence, a printing regulation law (Printing Press Regulations Ordinance) to protect the Press was enacted in 1933.

The participation of business people and organizations who saw the great potentials in Nigeria's emerging and burgeoning printing industry took the industry to great heights. A

businessman by the name Adeshigbin inaugurated his Tika-Tore Press in 1910. This was followed by the establishment of the CMS Press in Lagos in 1913. Worthy of mention is Samuel Pearce who started Awoboh Press in 1920. Others that followed suit in 1923 included Ajibade's Hope Rising Press, Washington Osilaja's Ife Olu Press, P.C. Thomas' Ekabo Press and Babamuboni'sTanimola Press. All the above mentioned presses provided cheap and competitive printing services to newspaper publishers.

A landmark in the history of printing in Nigeria was made with the inauguration of the Nigerian Printing and Publishing Company in 1925 to publish the Nigerian Daily Times. The company, with the availability of sufficient funds, was able to purchase a printing plant "sufficient to set up a printing house capable of publishing the Nigerian Daily Times and the African Messenger and local job work" (Echeruo, 1976). Thereafter, in September 1925, the company purchased a second-hand Demy Wharfadale Printing machine and accessories, a new guillotine, type accessories, paper and insurance. During this period, the Daily Times printery had no mechanical composing machine for type assembly, but then the dexterity of the compositors of this era remains a marvel as they could assemble eight to ten words a minute. The mechanical composing machine (Intertype) was eventually introduced in the company in 1939.

Progressively, the printing business in Nigeria continued to grow due to its viability, which accounted for well over 30 print houses as at 1930. In 1948, a UK newspaper "Daily Mirror" successfully bought into the Nigerian Printing and Publishing Company, thus bringing forth the first rotary printing press imported into Nigeria from England. In

addition, more linotypes and other necessary machinery were shipped in. This was a shot in the arm for the newspaper company as it signaled the beginning of immense technological development for the Daily Times printery and by consequence the budding printing industry in Nigeria at that point in time. The period 1948-1958 brought with it massive development in printing technology in Nigeria. This was the period in which the Daily Mirror Newspapers Limited of London successfully acquired shares in Daily Times newspapers. Mechanical composing machines, founding equipment and a one-unit Foster rotary Press were shipped in from the Daily Mirror in London to Lagos. The rotary printing machine made mass production possible and this gave Daily Times an edge over other printing presses. For a very long time letterpress printing process held sway in the Nigerian printing Industry.

By the 1970s, however, the print demands of Nigerians had exceeded what letterpress could deliver. This brought about the era of lithography and offset machines. From the late 70s to late 90s, printing companies gradually transited from letterpress and embraced offset machines. Rather than use metal types, printing could be done using photosensitive plates. Cut and paste graphic artists had a field day. Production was faster. Printed information could reach the populace faster. Information was flowing, shaping the thoughts, the outlook and perceptions of Nigerians.

2.10.1The Digitalization of Print in Nigeria

The late 1980 and the early 1990s featured the era of computers with various types of hi-tech printing equipment emerging on the printing industry landscape. Available records

indicate that Task Systems in 1987, pioneered desktop publishing and computer graphics in Nigeria with Apple Computers (Nigeria Communications Week, 2010). Today, the printing industry is hugely driven by computer technology, resulting in better print quality, faster production and higher profit for print investors. Technology has served print production in various ways. Computers have made page layout and printing faster and more accurate, helping to control production cost and give better print quality. Easy-to-use, and inexpensive computer hardwares and softwares can now be combined for desktop publishing, small-scale print design, layout and production. Afolabi (2008) in his analysis of the effect of technology on the print media industry in Nigeria notes that technological changes in the industry have been spurred by print buyers' demand for high quality colour reproduction, shorter print runs and shrinking production cycle times. He also said that in addition there also comes to play printers' search for ways to decrease production cost, increase efficiency and enhance customer satisfaction. In essence, it can be said that the Nigerian printing industry, in tune with global practice, is not behind in adopting new technologies with a view to attaining high levels of competitiveness.

Colour separation started in Nigeria with the use of analogue separation. Awoga (n.d) records that Chronograph Limited located then around TafawaBalewa Square in Lagos started experimenting with commercial colour separation around 1969-1970. Another name associated with pioneering colour separation in Nigeria in the late sixties is Academy Press in Lagos. Digital colour separation actually commenced in Nigeria during the 1990's when print investors saw the need and viability of colour separation in the print production process. By mid-1990's a number of colour separation outfits such as Vicoda Repro,

Lithotec, Transcan, Hywill Graphics, MacGrafix and Clear impression were on ground to provide the much-expected digital colour separation needs for the printing industry (Printers Digest,2005). Eventually, Computer to plate system completely phased out the need for films. In this technology, the image created in a Desktop Publishing (DTP) application is used as an output directly to a printing plate. Kipphan (2001) notes that since several intermediate film-handling stages in the production of the printing plates are dispensed with, it has become easier to meet the quality requirements of print jobs. Punch Newspapers made the pioneer effort of introducing the use of CTP (computer-to-plate) in newspaper production in Nigeria in 2003. Little wonder then that the newspaper ranks high in terms of revenue from print advertisement. The print output of the newspaper is superlatively high and in the words of AzubuikeIshiekwene "the introduction of the use of CTP (computer-to-plate) and the use of digital cameras by reporters has helped to improve speed, quality and efficiency (www.afrol.com).

Direct Image (DI) technology, the technology that prints directly from the computer to the printing press, was introduced in Nigeria in 2001. Planet press in Lagos pioneered the cutting edge technology. Prior to this, high quality printing was done abroad. Since the emergence of DI in 2001, such high quality printing is now done in Nigeria. At present, there are several DI centers dotting the landscape of Nigeria. A digital press does not use plates or static image carriers, so each printed piece can be completely different from the last (Digital printing; NAPL,). Berlin, Kim and Talcott (2004) explain that digital printing is an integral process for both on-demand and variable-data printing. They explain that "with digital printing, each impression can be different because it does not use image

plates or static image carriers; the image is created on the images carrier for each impression". Berlin, Kim and Talcott (2004) are of the view that this feature of the digital press makes it a good tool for personalization of print communication products. In a similar vein, Clem and Link (2005) explain that since the printed product created by the digital press requires less setup for production than traditional printing methods, it is typically more economical (less cost per impression) for use in short-run printing situations"

However, digital printing may not be the most economical solution to jobs of large volumes. The saying "technology drives business and business drives technology" holds true with the development of the digital press in the print communications industry.

The need for personalization, which is the hallmark of direct-mail advertising, provides an impetus for the deployment of digital presses. Direct-mails like sales letters, brochures, and catalogs are efficient, effective and economical media for sales and business promotion. These print products can be personalized for each recipient since each can contain different names, addresses, colours, or any other information that is programmed from the database.

The increasing growth of the direct marketing industry in Nigeria has provided a market for digital presses which office equipment manufacturers like Xerox, OKI print solutions; Konika Minolta and Hewlett Packard, are tapping into. There is no doubt that the further growth of the direct marketing industry will bring about a corresponding increase market for digital presses. Aside the need for personalization, the increasing demand for short run jobs presents more markets for manufacturers and marketers of digital presses. The internet penetration in Nigeria is growing steadily.

2.11 Theories of Entrepreneurship

The study of entrepreneurship is based on several theoretical backgrounds. These theories form the basis upon which the study of entrepreneurship is anchored. The entrepreneur and his unique risk bearing function was first identified in the early 18th century by Richard Cantillion, an Irishman living in France, who defined entrepreneur as a person who buys factor services at certain prices with a view to selling it at uncertain prices in the future (Kilby, 1971). In support of this, ShafiulAlam andMohiuddin (2014) posit that, economic development and entrepreneur are closely related to each other. In any economy entrepreneur is the central figure of economic activity and propeller of development under free enterprise because industrial development is brought out by entrepreneurs. They added that, the development or under development of an economy is the reflection of the development and or underdevelopment of entrepreneurship in the society. As such; different theories exist because of the different views of researchers who propounded these theories. Among these theories are;

2.11.1 Sociological Theory of Entrepreneurship

The theory of sociology is another underlying factor behind the study of entrepreneurship. It was formulated by Hagen in 1962 and was more concerned with socio-historical process which produces the psychological 'needs' behind the entrepreneurial disposition and less with the specific casual connections between such needs and the recruitment of performance of entrepreneurs. Hagen incorporates other needs such as intelligence.Sociological theorists of entrepreneurship were preoccupied with the analysis of need distribution among members of a society but strongly criticized the notion that the

most fundamental causal factors behind the emergence and performance of entrepreneurs are psychological.

This is based on the argument that the psychological approach is too simple and misleading especially when it is applied to the explanation of business performance (Hagen, 1962). In support of this, Kilby (1968) opines that entrepreneurship results from "adaptation". To be an entrepreneur, one must be able to adapt to his/her environment. According to him, adaptation is a factor for environment analysis which helps in identification of business opportunity and area of needs in a particular environment. Without adaptation, no matter how good an idea might sound, it will not metamorphose into reality as an enterprise. To contrast the ideological factor to the study of entrepreneurship, the sociologists argued that a person's environment is the major motivating factor that can spur him/her into entrepreneurship. Ideas, traits and motives are not enough on their own for entrepreneurship to manifest. There must be an enabling environment coupled with business opportunities for a new venture to emerge. Johnson (1996) in his view on sociological perspective to entrepreneurship suggested that "a detailed description of the environmental context is required before drive for achievement can be a motivating factor for entrepreneurships".

This social context differs from one environmental setting to another. Reynolds (1991) however, identified four (4) different social contexts that can be used in defining sociological enterprise. These include; social networks, life course stage, ethic identification and population ecology stage, Individual sociological background, acts as

push factor that determines the social context of entrepreneurship. In support of this, Reynolds (1991) stated that "the inability of traits theories to predict entrepreneurship could result from the ignorance of social context and choices confronting the individual when the decision is made". In other words there is a positive correlation between the economic factor and social control that exist in a particular environment.

2.11.2 Economic Theory of Entrepreneurship

The theorists here saw an entrepreneur as an agent of economic change. They argued that changes either in the environment or organization are a transformation that can occur as a result of the reaction of some economic forces. Economists assume that entrepreneurs behave rationally towards some economic forces (business opportunities, resources etc.) that result to change in environment in form of enterprise. Entrepreneurship was seen as a process or positive event to every economic revolution. Without entrepreneurs, the other factors of production such as land, labour and capital cannot transform themselves into economic value (product and services).

Theorists such as Knight, et al (1978) argued that: *Entrepreneurs play a distinct role in the market system through their evaluation of factors of production. While consumers evaluate goods in use, entrepreneurs evaluate the productivity of goods towards generating value in use they assess the value of the factors of production in generating value useful to consumers.*

Unlike other theories, economic theory placed values on each of the factors of the production and saw them as distinct economic agents in the production process.

2.11.3 Innovative theory of Entrepreneurship

Innovation as a theory of entrepreneurship is accredited to Schumpeter (1934) and it is also called Schumpeterism (Wood, 2005). Innovation is the prime driver of economic progress as Schumpeter recognized it. Entrepreneurs create many of the innovations that shape our lives in small and medium scale businesses (Kickul, Welsch and Gindry, 2001). According to Schumpeter (1934), "innovation is the major force behind entrepreneurship". He further argued that 'Every growth oriented venture is a function of innovation and without innovation, the theory of entrepreneurship does not exist". To bolster more on his point, he proposed that:

> 'In part it (bourgeois society) appeals to, and in part it creates, a schema of motives that is unsurpassed in simplicity and force. The promises of wealth and the threats of destitution that it holds out, it redeems with ruthless promptitude where ever the bourgeois way of life asserts itself sufficiently to deem the beacons of other social world. These promises are strong enough to attract the large majority of supernormal brains and to identify success with business. The fundamental impulse that sets and keeps the capitalist engine in motion comes from the new consumers' goods, the new methods of production or transportation, new processes and new merchant. The new markets and the new forms of industrial organization that capitalist enterprise creates - innovation is what entrepreneurship is all about (Schumpeter, 1943).

Schumpeter also saw entrepreneurship as a fundamental factor in the economic developmental process and entrepreneur as an innovator who is different from a bureaucratic executive of an organisation that merely runs an establishment. He argued that "an entrepreneur must not necessarily be a developmental planner or an inventor but should be able to manipulate a specific enterprise that is already in existence, create and carve new things out of its form innovation". Schumpeter gave several examples of what

he meant by a new combination in the area of' the economy: "the introduction of a new quality of goods, or a new use of an already existing goods, … a new production method, ... the opening up of a new market (and) the change of economic organisation, e.g., in founding a trust, establishing a large corporation, etc." He also stated that "the most common form of entrepreneurship is to create new firms. The most typical case representing all the different possibilities and all the different sides of the matter, the organisational, commercial, technical side, etc., is the founding of a new enterprise." In support of Schumpeter theory, Baumol (1993) drew a distinction between an organising-entrepreneur and an innovating - entrepreneur. According to him, "an organizing entrepreneur creates, manages, organises and operates a new business firm while an innovating entrepreneur transforms ideas into economically viable entities".

Baumol (1993) in his assertion attacked the economic theory by emphasising that: *An entrepreneur is a person whose behaviour is difficult to be described or analyzed and his actions cannot be controlled rigidly by the dictates of sophisticated optional calculations or models. Entrepreneurs' attitude of continuous change makes their behaviours and actions more difficult to be predicted.* Drucker*(1985)* also supported Schumpeter theory of entrepreneurship by adding that entrepreneurs must not only be innovative but should also be creative. Drucker saw creativity as an important force behind entrepreneurship. According to him, creativity births innovation and without creativity, economy will remain in a static position or what he called equilibrium stage which does not enhance development.

Entrepreneurship therefore destabilizes the state of equilibrium in the economy and set forces of disequilibrium in motion which births economic entities in form of ventures. Without innovation, creativity and invention add no value to an economy. According to Schumpeter the entrepreneur is bearer of the "mechanism for change". Change can occur from both inside and outside the economy. Changes, development or entrepreneurship is defined "by the carrying out of new combinations. "The carrying out of new combinations we call "enterprise"; the individuals whose function it is to carry them out we call "entrepreneurs". Entrepreneurs are seen as initiators of ideas and production process that can birth new products and services in a particular environment.

Entrepreneurship is a way of organizing vast business so that work becomes a joyful expression of one's contribution to society. Where by all his socio-economic, organizational and managerial qualities are always directed towards the well-being of the society or community. Thus, the concepts of entrepreneur and entrepreneurship have been investigated from economic, social, political, cultural, managerial and environmental points (ShafiulAlam andMohiuddin, 2014).

2.12 Theoretical Framework

The study is located on "Human Capital and Economic Growth" the theory propounded in 1991 by Robert, which advocates education as a tool for improving human capital, stimulating labour productivity and boosting the levels of technology across the globe. Human capital theorists encourage spending on nation's workforce (people working with public and private sector organisations) because expenditure on training and development

is a productive investment like investment on physical assets (Olaniyan and Okemakinde, 2008). Besides, human capital enhancement through quality education is a critical factor that propels economic growth and sustainable development in East Africa, Hong Kong, Korea, Singapore, and Taiwan. Temple (2001) views education acts as an impetus for improving labour quality, driving the spread of new knowledge and improving labour's ability to introduce, imitate and apply advanced technologies. To support this, Van-Den-Berg (2001) establishes a correlation between the level of education and new product development in knowledge-based economies that invested massively in education, technology and related growth elements.

Human capital refers to the stock of competencies, skills, knowledge and personalities attributes embodied in individuals who facilitate their ability to perform labour for the creation of personal, economic and social vale (OECD, 2001), labour is one of the factors of production and can also be referred to as workforce. One of the major investments on human capital is education and that is why Arabi and Abdalla (2013) emphasize thatthe quality of the education has a determinant role in the economic growth, the highly educated people are influencing more the economic output than the secondary educated ones. Olaniyan and Okemakinde (2008) observe that it is the human resources of any nation, rather than its physical, capital and material resources, which ultimately determine the character and pace of its economic and social development.

According to Babalola (2003) the rationale behind investment in human capital is based on the following arguments; that the new generation must be given appropriate part of

knowledge which has already been accumulated by previous generation. That the new generation should be taught how existing knowledge which has already been accumulated by previous generation, should be used to develop new product. He also added that by introducing new processes, production methods and social services, the people must be encouraged to develop entirely new idea, production processes and methods through creative approaches. Human capital theory suggests that education or training raises productivity of workers by imparting useful knowledge and skills,

Garba (2002) shows that there are positive correlation between educational attainment and economic growth and development carrying out a cross-country analysis using regressions. Loening (2002) examines two different channels by which human capital is expected to influence growth. The result revealed that a better educated labour force appeared to have positive and significant impact on economic growth via factor accumulation as well as on evaluation of total factor productivity. Adamu (2003) undertakes an empirical investigation to determine the impact of human capital formation on economic growth in Nigeria between 1970 and 2000, using integration and error-correlation mechanisms. The result indicated that investment in human capital in form of education and training can lead to economic growth because of its impact on labour productivity. Dauda (2010), in his study on human capital formation and economic growth in Nigeria used the endogenous growth model in his investigation into their relationship, he employed enrolment in the different levels of education, primary, secondary and tertiary as proxies for human capital and found long-run positive relationship between human capital formation and economic growth in Nigeria with a feedback mechanism.

Moser and Eliot (2005) both have asserted that in the long run, education increases substantially, household income as well as economic growth while Bils and Klenow (2000), Easterly and Levine (2001), Temple (2001), Bosworth and Collins(2003) have failed to establish positive association between human capital (years of schooling) and economic growth. Mba, Mba, Ogbuabor, and Ikpegbu (2013) use a multiple linear regression model in human capital development and economic growth in Nigeria and found that the key to the nation's economic development lies on the human capital development. They suggested that more pronounced results could be obtained in the area of efficient utilization of public funds allocated to the sub-sectors (like the education) that constitute human capital development and ways of enhancing human capital contributions to capacity building in Nigeria.

Therefore, this study is premised on the theory of Human Capital and Economic Growth. The researcher has attempted to show that established constraints are of great consequence in the study of Comparative Study of Print-Based Graphic Design Facilities in Selected Universities and in Graphic Design Industry in Nigeria. As a consequence, the researcher argues in principle that there is some critical leverage to be had from exploring a broadlyconceived notion of teaching the students what they need to know, and learning with the types of facilities presently on ground and provided by some public universities in Nigeria for print-based graphic design production. It is the *contradictions* that exist between notions of structure on the one hand, and the expectation of print-based industry from the public universities on the other, that have motivated the researcher, together with

a rejection of positions that support a principled adherence to one at the expense of the other.

By contrast, the work presented in this dissertation reflects an attempt to produce a more nuanced analysis of Comparative Study of Print-Based Graphic Design Facilities in some Selected Universities and in Print-Based Industry in Nigeria, by exploring the relationship between the constraining and enabling effects of students' quality and the employable needs of print-based design industry in Nigeria. This is made all the more feasible because of the recent developments in technology, social and cultural investigation that propelled, enabling and legitimating this line of thinking.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter specifically presents the methods and procedures that were used in the collection of the data for this study. It addresses the following areas; selection of the population for the study; description of the instrument; procedures for the collection; pilot test and the statistical analysis of data.

3.2 Research Design

The research design employed for this study is descriptive survey research. Survey examines a sample from a population, which involves the systematic collection of data from a population through interviews or structured questionnaire technique (Ngu in Kange, 2011). Surveys have been used by a number of studies related to observation and content analysis.Kange (2011) employed the survey method in a research to analyse the Design and Development of Directional sign using medical pictograms and bilingual inscriptions for Ahmadu Bello University teaching Hospital (ABUTH) Shikazaria.

3.3 Population

The population of this study comprises of all Nigerian public universities that offer graphic design as a course as provided by the Joint Admission Matriculation Board (JAMB) brochure 2016, which are as follows; Ahmadu Bello University, Zaria., Federal University of Technology Akure., AbubakarTafawaBalewa University, Bauchi; ModibboAdama University of Technology, Yola., Plateau State University, Bokkos., Cross River State

University of Technology, Calabar., Imo State University, Owerri.,University of Jos., LadokeAkintola University of Technology,Ogbomosho., ObafemiAwolowoUniversity,Ile-Ife., NnamdiAzikiwe University, Awka.,University of Uyo., Delta State University, Abraka., University of Benin., Abia State University Uturu., Federal University, Kashere., Federal University Ndufu., University of Nigeria Nsukka, Niger Delta University Amassama., University of Maiduguri, University of Lagos, University of Port Harcourt, Federal University Lifia, and printing industries in Nigeria. The subjects include lecturers, final year students and graduates of Graphic design, print based company's supervisor and equipment/machines.

3.4 Sampling Technique

The Sampling Technique employed for this study is a non-probability sampling, specifically purposive sampling, whereby the researcher selected numbers of objects that poses feature of interest from a given population to form part of the sample; This is because only the samples or groups of samples that is relevant to the study were selected and this sampling method also helps to ensure that samples that were difficult to locate but crucial to the study were included (Kerling, 1973; Bello and Ajayi, 2000; Sale, 2010).

3.5 Sample Size

For this study therefore, Federal universities that have Industrial Design as a department were chosen as samples to be considered. They are Ahmadu Bello University, Zaria;AbubakarTafawaBalewa University, Bauchi; Federal University of Technology, Akure and Federal University of Technology, Yola,

3.6 Research Instruments

The instruments used to collect data for the study were asfollows; structured questionnaires, observational guide and oral interview and camera to obtain information. The questionnaires were made up of two sections. Section A seeks the demographic information of the respondents; section B asks questions on the adequacy of available print-based facilities in the public universities. The camera was used to take photographs of the print-based facilities in both the universities and the print-based design industries.

3.7 Validity of the Instruments

To achieve the objectives of this research as well as to answer the research questions that served as an interview guide in conducting the research discussions served as evidence to support inferences drawn by the researcher. The instruments were evaluated before the commencement of the field work.

3.8 Pilot Test

Pilot test was conducted to ascertain the validity and reliability of the research instrument in order to determine whether the problems focused on exist in the area of study. Thus, questionnaires were used to elicit information from university where the students and lecturers were sampled for the pilot test. The copies of the questionnaires were analysed to ascertain the reliability and validity of the instrument.

3.9 Method of Data Collection

Data was obtainedusing questionnaire, camera and personal interview from respondents. Structured,likert-scale questionnaire were designed by the researcher to elicit information of the participants for the purpose of the study. The camera was used to take photographs of the print-based facilities in both the universities and the print-based design industries.

3.10 Procedure for Data Analysis

The data was analysed using both quantitative and qualitative method. Quantitative data was discussed with the help of Likert-type five point scale. A structured questionnaire was adopted for interpretation of findings. A total number of sixty copies of questionnaire were administered to final year Graphic Design students of some selected Nigerian Universities and fifty were retrieved for analysis. At the AbubakarTafawaBalewa University Bauchi, the final year students were six in number; the researcher personally administered copies of the questionnaire to the six students and collected all of thesix copies. At the Ahmadu Bello University Zaria, the final year students were twenty in numbers, of which five of the students participated in the pilot study of this research. The researcher personally administered and collected fifteen copies of the questionnaire from the students. At the Federal University of Technology Akure, the final year students were thirty-three the researcher administered thirty-three questionnaires and collected twenty-four. At the ModibboAdama University of Technology Yola, the final students were six, the researcher administered six copies of the questionnaire.

Two print-based graphic design industries were considered from each of the states where these design schools are located; In Bauchi, ATBU ATIL printing Press, one graphic

design graduate staff and one supervisor were administered questionnaire and collected at completion by the researcher. At Ramadan Press Bauchi, one graphic design graduate staff and one supervisor were administered questionnaire and collected at completion by the researcher. Excell Global printers Ltd, Kaduna one graphic design graduate staff and one supervisor were administered the questionnaire and collected at completion by the researcher. Unique – Ace Integrated Ltd, Kaduna one graphic design graduate staff and one supervisor were administered questionnaires and collected at completion by the researcher. In Akure, Flamingos Digital prints, two graphic design graduate staff and one supervisor were administered questionnaire and collected at completion by the researcher. Signal 7000 digital two graphic design graduate staff and one supervisor were administered copies of the questionnaire and collected at completion by the researcher. And lastly, in Yolain ABTI Press two graphic design graduate staff and one supervisor were administered copies of questionnaire and collected at completion by the researcher. And Microtrend Digital Prints one graphic design graduate staff and one supervisor were administered copied of the questionnaires and collected at completion by the researcher.

Qualitative data was analysed using frequency distribution and percentages. Information and the results were discussed and findings outlined. The data were treated in tables.

CHAPTER FOUR

ANALYSIS OF DATA AND RESULTS

4.1 Introduction

This chapter reviewed the responses of the respondents and contains analyses of data collected. The results obtained from the questions asked are analysed and presented below in simple percentile mean and standard deviation; with the aid of Statistical Package for the Social Sciences (SPSS). This method was adapted for the simple reason that it facilitates statistical interpretation.

4.2 Analysis of General Characteristics of Respondents

This chapter discusses the response of the respondents and contains analysis of data collected. The subjects used for this study consist of graphic design lecturers, final year undergraduate students from four federal universities and graphic design graduates and supervisors working in the eight selected companies in the graphic design industry in Nigeria.There are four sets of questionnaire responses among ten graphic design lecturers, fifty final year undergraduate students from selected Nigeria Universties, eleven graphic design graduate staff andeight supervisors working with print-based graphic design industies. The questionnaires where self-administered. Five copies of the questionnaire for lecturers were administered at each of the selected universities. The number was based on the fact that graphic design as a programme does not have a large number of lecturers and students as compared to other art related programmes. Out of the five copies of the questionnaire administed at AbubakarTafawaBalewa University, Bauchi.Threecompleted

copies were returned.The researcher was informed that the department had only three lecturers in graphic design. At the Ahmadu Bello University Zaria, the researcher personally collected three completed copies of the questionnaire, however two of the lecturers in graphic design section are supervising this thesis,they were not administered copies of the questionnaire. Two completed copies of the questionnaire were collected out of the five administered. At the Federal University of Technology, Akure. The researcher gathered that three of the lecturers were on study leave. At the ModibboAdama Universities of Technology Yola, copies of the questionnaire were personally administered by the researcher who collected two completed copies of the questionnaires. The researcher gathered that two of the graphic design lecturers at MAUT were on study leave.

4.2.1 Analysis of Lecturers' QuestionnaireTable 4.1 Distribution of Respondents by Institution

Variable	Frequency	(%)	Valid (%)	Cumulative (%)
AbubakarTafawaBalewa University, Bauchi.	3	30.0	30.0	30.0
Ahmadu Bello University, Zaria.	3	30.0	30.0	60.0
Federal University of Technology, Akure.	2	20.0	20.0	80.0
ModibboAdama. Federal University of Technology, Yola	2	20.0	20.0	100.0
Total	**10**	**100.0**	**100.0**	

From the table above, 3(30%) of the respondents were from Abubakar Tafawa Balewa University, Bauchi and 3(30%) of the respondents were from Ahmadu Bello University, Zaria, while 2(20%) of the respondents were from Federal University of Technology,

Akure andModibboAdama. Federal University of Technology, Yola respectively. This reveals that Abubakar Tafawa Balewa University, Bauchi and Ahmadu Bello University, Zaria had more respondents.

Table 4.2 Distribution of Respondents by Gender

Variable	Frequency	(%)	Valid (%)	Cumulative (%)
Male	10	100.0	100.0	100.0
Female	0	0	0	100.0
Total	**10**	**100**	**100**	

From the table above,10(100%) of the respondents were male. This shows that all the respondents were male.

Table 4.3 Distribution of Respondents by Age Group

Variable	Frequency	(%)	Valid (%)	Cumulative (%)
30-39 Years	3	30.0	30.0	30.0
40-49 Years	3	30.0	30.0	60.0
50 and Above Years	4	40.0	40.0	100.0
Total	**10**	**100.0**	**100.0**	

From the table above,4(40%)of the respondents fell within the age of 50years and above and 3(30%) fall within the age of 40 to 49 years, while 3(30%) fell within the age of 30 to 39 years. The table reveals that the highest catagory of the respondents fall within the age of 50years and above.

Table 4.4 Distribution of Respondents by Marital status

Variable	Frequency	(%)	Valid (%)	Cumulative (%)
Married	9	90.0	90.0	90.0
Single	1	10.0	10.0	100.0
Total	**10**	**100.0**	**100.0**	

From the table above, 9(90%) of the respondents are married.while 1(10%) is single This reveals that most of the respondentsare married.

Table 4.5 Distribution of Respondents by Qualification

Variable	Frequency	(%)	Valid (%)	Cumulative (%)
Doctorate	2	20.0	20.0	20.0
Masters	7	70.0	70.0	90.0
Bachelor	1	10.0	10.0	100.0
Total	**10**	**100.0**	**100.0**	

From the table above,7(70%) of the respondents fall within those with a Master degree and 2(20%) fall within those with a Doctorate degree, while 1(10%) fall within those with a Bachelor degree. This reveals that most of the respondents fall within those with a Masters degree.

Table 4.6 Distribution of Respondents by Years of Employment by the University

Variable	Frequency	(%)	Valid (%)	Cumulative (%)
0 - 5	1	10.0	10.0	10.0
6 - 10	4	40.0	40.0	50.0
11 - 15	1	10.0	10.0	60.0
16 And above	4	40.0	40.0	100.0
Total	**10**	**100.0**	**100.0**	

From the table above, 4(40%) of the respondents fall within those with 16 years and above working expirence with the intitution and 4(40%) fall within those with 6 to 10 years working expirence, while 1(10%) fall within those with 11 to 15 and 0 to 5 years working experience respectively. This reveals that most of the respondentsfall within those with 16 years and above working expirence and those with 6 to 10 years working expirence with the intitutions.

Table 4.7 Distribution of Respondents by Description of Service to the Institution

Variable	Frequency	(%)	Valid (%)	Cumulative (%)
Lecturer	9	90.0	90.0	90.0
Administrator/Counselor	1	10.0	10.0	100.0
Total	**10**	**100.0**	**100.0**	

From the table above, 9(90%) of the respondents are Teachers.while 1(10%) is an Administrator/Counselor. This reveals that most of the respondents are Lecturers.

Table 4.8 Respondents' response to the question which sought to find out the availability of print based facilities in public universities.

		SA		A		D		SD		U	
		F	%	F	%	F	%	F	%	F	%
1	The print-based design facilities in my institution are a physical representation of the standard educational vision in Nigeria	1	10	2	20	6	60	0	0	1	10
2	Graduates of my institution are equipped to take on responsibilities in the real world of print-based graphic design	1	10	6	60	1	10	1	10	1	10
3	there is planning and management in adopting technology in a faster and more proactive way in the public universities	0	0	2	20	4	40	0	0	4	40
4	Students in my institution are taught with the latest technology in the print-based graphic design profession	1	10	2	20	5	50	0	0	1	10
5	In my institution students learn through practical demonstration of the latest technology in the print-based graphic design field	1	10	2	20	2	20	2	20	3	30
6	The print-based graphic design facilities in my institution meet the needs of department, staff and students	1	10	0	0	6	60	2	20	1	10
7	In my institution there is a printing press that belongs to the institution	1	10	6	60	2	20	1	10	0	0
8	Public universities have met the man power development needs in an ever evolving high tech driven print-based graphic design industry	0	0	1	10	4	40	3	30	2	20
9	Graduates need re-training/internship programme to be able to function properly in the print-based graphic industry	6	60	2	20	1	10	0	0	1	10
10	More is expected from relevant authorities in terms of printing facilities in Nigeria's public universities	5	50	5	50	0	0	0	0	0	0

Table 4.8 Respondents response to the availability of print based facilities in public universities, Data from the table above, reveals that majority of the respondents agree that print based teaching facilities are not avalible in the public universities.

Table 4.9 Respondents' response to the question which sought to find out the gap between teaching facilities in some universities and the print-based industry.

		SA		A		D		SD		U	
		F	%	F	%	F	%	F	%	F	%
1	The print-based graphic design is a vital aspect of the students' development process as graphic designer	9	90	1	10	0	0	0	0	0	0
2	On graduation, students should be able to demonstrate technical proficiency in (print based) graphic design	4	40	5	50	1	10	0	0	0	0
3	Students on graduation should be able to demonstratemanagerial proficiency in print-based graphic design	5	50	4	40	1	10	0	0	0	0
4	Public universities are expected to move with the trend of technological development in the print-based graphic design profession	9	90	1	10	0	0	0	0	0	0
5	Public universities do not have detailed understanding of the needs of the print-based graphic design industry (students quality)	3	30	4	40	3	30	0	0	0	0
6	My institution has a detailed understanding of the new challenges brought by the paradigm shift in the print based industry	0	0	5	50	2	20	0	0	3	30
7	Acquiring these print-based graphic design facilities required detailed understanding of the relationship between universities and the need of the (print based) graphic design industry	4	40	6	60	0	0	0	0	0	0
8	There is need to identify innovative models for financing print-based graphic design facilities in public universities in Nigeria	8	80	1	10	0	0	0	0	1	10

Table 4.9 Respondents response to the question on the gap between teaching facilities in some universities and the print based industry in Nigeria. Data from the table above, reveals that majority of the respondents agree that there is a gap between the universties and the print based industry .

4.2.2 Analysis of Students' Questionnaire

Table 4.10 Distribution of Respondents by Institution

Variable	Frequency	(%)	Valid (%)	Cumulative (%)
AbubakarTafawaBalewa University, Bauchi.	6	12.0	12.0	12.0
Ahmadu Bello University, Zaria.	15	30.0	30.0	42.0
Federal University of Technology, Akure.	24	48.0	48.0	90.0
ModibboAdama University of Tech., Yola.	5	10.0	10.0	100.0
Total	**50**	**100.0**	**100.0**	

From the table above, 24(48%) of the respondents were from Federal University of Technology, Akure, 15(30%) were from Ahmadu Bello University, Zaria while 6(12%) were from Abubakar Tafawa Balewa University, Bauchi and 5(10%) of the respondents were from and ModibboAdama Federal University of Technology, Yola. This reveals that Federal University of Technology, Akure,had more numbers respondents among students.

Table 4.11 Distribution of Respondents by Gender

Variable	Frequency	(%)	Valid (%)	Cumulative (%)
Male	41	82.0	82.0	82.0
Female	9	18.0	18.0	100.0
Total	**50**	**100.0**	**100.0**	

From the table above, 41(82%) of the respondents were male while 9(18%) of the respondents were female. This shows that there were more male than female respondents.

Table 4.12 Distribution of Respondents by Age

Variable	Frequency	(%)	Valid (%)	Cumulative (%)
15-19 Years	1	2.0	2.0	2.0
20-24 Years	24	48.0	48.0	50.0
25-29 Years	22	44.0	44.0	94.0
30 and above Years	3	6.0	6.0	100.0
Total	**50**	**100.0**	**100.0**	

From the table above, 24(48%) fall within the age of 20 to 24 years and 22(44%) fall within the age of 25 to 29 years, while 3(6%) fall within the age of 30 and above and 1(2%) fell within the age 15to 19years. The table reveals that most of the respondents fall within the age of 20 to 24 years.

Table 4.13 Distribution of Respondents by Marital Status

Variable	Frequency	(%)	Valid (%)	Cumulative (%)
Married	3	6.0	6.0	6.0
Single	47	94.0	94.0	100.0
Total	**50**	**100.0**	**100.0**	

Data from the table above, 47(94%) of the respondents were single while 3(6%) were married. This shows that there were more single respondents.

Table 4.14 Distribution of Respondents by Highest Educational Qualification

Variable	Frequency	(%)	Valid (%)	Cumulative (%)

WAEC	37	74.0	74.0	74.0
OND	3	6.0	6.0	80.0
HND	3	6.0	6.0	86.0
NCE	7	14.0	14.0	100.0
Total	**50**	**100.0**	**100.0**	

Data from the table above,37(74%) of the respondents fall within those with O'level WAEC Certificates and 7(14%) fall within those with an NCE, while 3(6%) fall within those with OND and HND respectively. This reveals that most of the respondents fall within those with WAEC.

Table 4.15 Distributions of Respondents by Years of Course in University

Variable	Frequency	(%)	Valid (%)	Cumulative (%)
4 Years	15	30.0	30.0	30.0
5 Years	35	70.0	70.0	100.0
Total	**50**	**100.0**	**100.0**	

From the table above, 35(70%) of the respondents fall within those whose course duration was 5 years and 15(30%) fall within those whose course duration were 4 years. This reveals that most of the respondents fall within those whose course duration were 5 years.

Table 4.16 Respondents' response to the availability of print based facilities in public universities.

		SA		A		D		SD		U	
		F	%	F	%	F	%	F	%	F	%
1	My institution has sufficient equipment to support a developmentally oriented curriculum.	2	4.0	7	14.0	23	46.0	16	32.0	2	4.0
2	My institution is moving with the trend of technological development in the print-based graphic design profession.	2	4.0	7	14.0	23	46.0	10	20.0	8	16.0
3	Students in my institution are taught with the latest technology in the print-based graphic design profession.	2	4.0	6	12.0	28	56.0	12	24.0	2	4.0
4	In my institution students learn through practical demonstration with the latest technology in the print-based graphic design field.	4	8.0	2	4.0	29	58.0	8	16.0	7	14.0
5	In my institution there is a printing press that belongs to the institution	20	40.0	3	6.0	17	34.0	9	18.0	1	2.0
6	Students often go to the institution's printing press for practical demonstration.	3	6.0	5	10.0	25	50.0	15	30.0	2	4.0
7	The universities have a planned and managed ways, in adopting technology in a faster and more proactive way.	6	12.0	1	2.0	23	46.0	12	24.0	8	16.0
8	With the practical knowledge acquired from my institution, on graduation should be able to demonstrate technical proficiency on print-based graphic design.	17	34.0	9	18.0	14	28.0	2	4.0	8	16.0

Table 4.16 Respondents' response to the availability of print based facilities in public universities, From the table above, it is revealed that majority of the respondents agree that Teaching Facilities are not available in the Nigeria public universities and students are stemmed to the use of modern (print based) graphic design facilities.

Table 4.17 Respondents' response to the question which sought to find out the gap between teaching facilities in some universities and the print-based industry.

		SA		A		D		SD		U	
		F	%	F	%	F	%	F	%	F	%
1	The print-based graphic design is a vital aspect of my developmental process as a graphic designer.	32	64.0	17	34.0	0	0	0	0	1	2.0
2	The print-based design facilities in my institution meet the needs of students.	0	0	2	4.0	29	58.0	14	28.0	5	10.0
3	The print-based design facilities in my institution meet the needs of lecturers.	1	2.0	1	2.0	35	70.0	9	18.0	4	8.0
4	The design facilities in my institution meet the needs of print-based graphic design industry.	3	6.0	1	2.0	30	60.0	13	26.0	3	6.0
5	Public universities are expected to move with the trend of technological development in the print-based graphic design profession.	33	66.0	15	30.0	1	2.0	0	0	1	2.0
6	As a class we have had the privilege of visiting a print based graphic design firm.	9	18.0	24	48.0	4	8.0	12	24.0	1	2.0
7	Graphic design (print based) industries are current in terms of technological development in the profession.	25	50.0	10	20.0	8	16.0	5	10.0	2	4.0
8	Graduates need re-training/internship programme to be able to function properly in the print-based graphic design industry	29	58.0	19	38.0	0	0	2	4.0	0	0

Table 4.17 Respondents' response to the question which sought to find out the gap between teaching facilities in some universities and the print-based industry.From the table above, it is revealed that majority of the respondents agree that there is a gap between the universties and the print based industry.

4.2.3 Analysis of Supervisors' Working with the (Print based) Design Industries Questionnaire.Table 4.18 Distribution of Respondents by Location

Variable	Frequency	(%)	Valid (%)	Cumulative (%)
Akure	2	25.0	25.0	25.0
Bauchi	2	25.0	25.0	50.0
Yola	2	25.0	25.0	75.0
Zaria	2	25.0	25.0	100.0
Total	**8**	**100.0**	**100.0**	

Data from the table above, 2(25%) of the respondents fall within those fromAkure and 2(25%) fall within those whose from Bauchi,Yola and Zaria respectively. This reveals that the respondents were equally represented.

Table 4.19 Distribution of Respondents' by Companies

Variable	Frequency	(%)	Valid (%)	Cumulative (%)

ATIL Press A.T.B.U Bauchi	1	12.5	12.5	12.5
ABTI Press Yola	1	12.5	12.5	25.0
Excell Global Printers Ltd Kaduna	1	12.5	12.5	37.5
Flamingo Digital Prints Akure	1	12.5	12.5	50.0
Micro trend Printers Ltd Yola	1	12.5	12.5	62.5
Ramada Press Bauchi	1	12.5	12.5	75.0
Signal 7000 Digital Akure	1	12.5	12.5	87.5
Unique-Ace Integrate Ltd Kaduna	1	12.5	12.5	100.0
Total	**8**	**100.0**	**100.0**	

Data from the table above, 1(12.5%) of the respondents, one each from every company listed respectively. This reveals that the respondents were equally represented.

Table 4.20 Distribution of Respondents' by Gender

Variable	Frequency	(%)	Valid (%)	Cumulative (%)
Male	6	75.0	75.0	75.0
Female	2	25.0	25.0	100.0
Total	**8**	**100.0**	**100.0**	

Data from the table above, 6(75%) of the respondents were male while 2(25%) of the respondents were female. This shows that there were more male than female respondents

Table 4.21 Distribution of Respondents' by Age Group

Variable	Frequency	(%)	Valid (%)	Cumulative (%)
30 - 39 Years	4	50.0	50.0	50.0
40 - 49 Years	3	37.5	37.5	87.5
50 and above Years	1	12.5	12.5	100.0
Total	**8**	**100.0**	**100.0**	

From the table above, 4(50%) fall within the age of 30 to 39 years and 3(37.5%) fall within the age of 40 to 49 years, while 1(12.5%) fell within the age of 50 and above. The table reveals that most of the respondents fall within the age of 30 to 39 years.

Table 4.22 Distribution of Respondents by Marital Status

Variable	Frequency	(%)	Valid (%)	Cumulative (%)
Married	8	100.0	100.0	100.0

From the table above, 8(100%) of the respondents were married. This shows that all the respondents were married.

Table 4.23 Distribution of Respondents by Highest Educational Qualification

Variable	Frequency	(%)	Valid (%)	Cumulative (%)
Masters	1	12.5	12.5	12.5
Bachelor	4	50.0	50.0	62.5
HND	3	37.5	37.5	100.0
Total	**8**	**100.0**	**100.0**	

From the table above,4(50%) of the respondents fell within those with Bachelor degree and 3(37.5) fell within those with an HND, while 1(12.5%) fell within those with Masters degree. This reveals that most of the respondents fell within those with Bachelor's degree.

Table 4.24 Distribution of Respondents' by duration of Employment by the Organization

Variable	Frequency	(%)	Valid (%)	Cumulative (%)
6 - 10	5	62.5	62.5	62.5
1 - 5	3	37.5	37.5	100.0
Total	**8**	**100.0**	**100.0**	

From the table above, 5(62.5%) of the respondents fall within those who had 6 to 10 years working expierence with the design industries. While 3(37.5%) fall within those who had1 to 5 years working expierence . This reveals that most of the respondents fall within those who had 6 to 10 years working expierence with the design industries.

Table 4.25 Distribution of Respondents' by assigned responsibility in the Organisations

Variable	Frequency	(%)	Valid (%)	Cumulative (%)
Supervisor	7	87.5	87.5	87.5
Others	1	12.5	12.5	100.0
Total	**8**	**100.0**	**100.0**	

From the table above, 7(87.5%) of the respondents were supervisors with the design companies, while 1(12.5%) fall within others working expierence.. This reveals that most of the respondents were supervisors with the design companies.

Table 4.26 Respondents' Response to the level of collaboration between (print base) graphic design industries and public universities in Nigerian.

		SA	A	D	SD	U

		F	%	F	%	F	%	F	%	F	%
1	Professionals in the print-based graphic design, both in the universities and the industries have not yet developed a network to share best practices.	5	62.5	3	37.5	0	0	0	0	0	0
2	Professionals in the print-based graphic design, both in universities and the industries have not yet developed a network to learn about new approaches.	3	37.5	4	50.0	1	12.5	0	0	0	0
3	Universities and professionals in the print-based graphic design industries share new innovations, technology and practice.	0	0	2	25.0	4	50.0	1	12.5	1	12.5
4	Those responsible for planning in the universities understood the relationships between universities and print-based graphic design industries in Nigeria.	0	0	2	25.0	5	62.5	1	12.5	0	0
5	There is a developed sound comparable performance indicators and benchmarking systems between universities and (print-based graphic design industries in Nigeria.	1	12.5	1	12.5	5	62.5	1	12.5	0	0
6	Professionals and universities in the print-based graphic design field have a common forum and supporting umbrella that brings them together.	0	0	2	25.0	5	62.5	1	12.5	0	0
7	Universities and professionals in the print-based graphic design industries enjoy cordial relationship, on how they would improve the industry.	1	12.5	1	12.5	5	62.5	1	12.5	0	0

8	Universities and professionals in the graphic design industries take the initiative of jointly organising seminars/workshops in support of the print-based graphic design field	0	0	2	25.0	5	62.5	1	12.5	0	0

Table 4.26 Respondents' Response to the level of collaboration between (print base) graphic design industries and public universities in Nigerian reveals that most of the respondents agree that there is a gulf in the level of collaboration between print-basedgraphic design industries and public universities in Nigeria.

4.2.4 Analysis of Frequency Table for Graduates Working in the Print-based Design Industries.

Table 4.27 Distribution of Respondents' by Companies

Variable	Frequency	(%)	Valid (%)	Cumulative (%)

ABTI Printing Press, Yola.	2	18.2	18.2	18.2
ATIL, ATBU Bauchi.	1	9.1	9.1	27.3
Excell Global Printers Ltd Kaduna.	1	9.1	9.1	36.4
Flamingo Digital Prints, Akure.	2	18.2	18.2	54.5
Micro trend Printers Ltd Yola.	1	9.1	9.1	63.6
Ramadam Press, Bauchi.	1	9.1	9.1	72.7
Signal 7000 Digital, Akure.	2	18.2	18.2	90.9
Unique Ace Integrated Ltd Kaduna.	1	9.1	9.1	100.0
Total	**11**	**100.0**	**100.0**	

Data from the table above, 2(18.2%) of the respondents each were from ABTI Printing Press, Yola.,Flamingo Digital Prints, Akure and Signal 7000 Digital, Akure respectively. While 1(9.1%) of the respondents each were from ATIL, ATBU Bauchi., Ramadam Press, Bauchi., Excell Global Printers Ltd Kaduna., Unique Ace Integrated Ltd Kaduna., Micro trend Printers Ltd Yola respectively. This reveals that ABTI Printing Press, Yola.,Flamingo Digital Prints, Akure and Signal 7000 Digital, Akurehad more respondents of 18.2% each.

Table 4.28 Distribution of Respondents' by Age Group

Variable	Frequency	(%)	Valid (%)	Cumulative (%)
20-29 Years	3	27.3	27.3	27.3

30-39 Years	6	54.5	54.5	81.8
40-49 Years	2	18.2	18.2	100.0
Total	**11**	**100.0**	**100.0**	

From the table above, 6(54.5%) fall within the age of 30 to 39 years and 3(27.3%) fall within the age of 20 to 29 years, while 2(18.2%) fall within the age of 40 to 49 years. The table reveals that most of the respondents fall within the age of 30 to 39 years.

Table 4.29 Distribution of Respondents' by Gender

Variable	Frequency	(%)	Valid (%)	Cumulative (%)
Male	8	72.7	72.7	72.7
Female	3	27.3	27.3	100.0
Total	11	100.0	100.0	

From the table above, 8(72.7%) of the respondents were male while 3(27.3%) of the respondents were female. This shows that there were more male than female respondents among practitioners in the industry.

Variable	Frequency	(%)	Valid (%)	Cumulative (%)
0 – 5	3	27.3	27.3	27.3
6 - 10	6	54.5	54.5	81.8

11 – 15	2	18.2	18.2	100.0
Total	**11**	**100.0**	**100.0**	

Table 4.30 Distribution of Respondents' by Year of Employment

From the table above,6(54.5%) of the respondents fall within those with 6 to 10 years working expirence with in the design industries and 3(27.3%) fall within those with 0 to 5 years working expirence, while 2(18.2%) fall within those with 11 to 15 years working experience. This reveals that most of the respondentsfall within those with 6 to 10 years working experience with the design companies.

Table 4.31 Distribution of Respondents' by Marital Status

Variable	Frequency	(%)	Valid (%)	Cumulative (%)
Married	7	63.6	63.6	63.6
Single	4	36.4	36.4	100.0
Total	**11**	**100.0**	**100.0**	

Data from the table above, 7(63.6%) of the respondents were married, while 4(36.6%) were single. This shows that there were more married than respondents.

Table 4.32 Respondents Response to the Gap between Teaching Facilities in the Nigerian Public Universities and that of the Design Industries

		SA	A	D	SD	U

		F	%	F	%	F	%	F	%	F	%
1	The universities and (print based) graphic design industries have a shared sense of responsibility for students learning	5	45.5	6	54.5	0	0	0	0	0	0
2	The (print based) graphic facilities in the public universities meet the needs of students	0	0	0	0	6	54.5	3	27.3	2	18.2
3	The print-based graphic design facilities in the public universities meet the needs of lecturers	0	0	1	9.1	4	36.4	3	27.3	3	27.3
4	The print-based graphic design facilities in the public universities meet the needs of graphic design based industries	1	9.1	0	0	6	54.5	4	36.4	0	0
5	Design based industries are well equipped in term of print-based graphic design facilities	5	45.5	6	54.5	0	0	0	0	0	0
6	On graduation from the public universities, graduates are able to demonstrate technical proficiency on print-based graphic design	0	0	2	18.2	8	72.7	1	9.1	0	0
7	Graphic design print-based industries are more current in terms of technological development in the field of design.	6	54.5	4	36.4	0	0	0	0	1	9.1
8	Graduates of the public universities are equipped to take on responsibilities in the real world of print-based graphic design	0	0	4	36.4	4	36.4	0	0	3	27.3
9	On graduation from the public universities, graduates are able to demonstrate managerial proficiency on print-based graphic design	1	9.1	6	54.5	3	27.3	0	0	1	9.1
10	Graduates need re-training/internship programme to be able to function properly in the print-based graphic design industry	10	90.9	1	9.1	0	0	0	0	0	0

Table 4.32 Respondents Response to the Gap between Teaching Facilities in the Nigerian Public Universities and that of the Design Industries, data from the table above, it is revealed that majority of the respondents agree that teaching facilities in the Nigeria public universities cannot be compared to those of the graphic print-based Design Industries.

4.3 Major Findings

Analysis from data collected in this study in an attempt to respond to the research questions administered to graphic design lecturers, final year students, graduates and supervisors working in some selected print-based companies.The following findings were made;

1. Print-based graphic design facilities in public universities were not adequately provided, obsolete in nature,and less relevant.
2. It was found that the print-based Graphic design industry has more state of- the art-printing facilities, as such; graduates need re-training/internship programme to be able to function properly in the print-based graphic design industry.
3. The finding revealed that there is a gap in the level of collaboration between public universities and (print-based) Graphic design industry in Nigeria.
4. Notably, some universities own printing establishment. It is revealed that Industrial design department in such schools have been operating in isolation from those printing establishment.
5. Sixty-six percent of the students respondents were of the hope of becoming entrepreneurs in print-based graphic design after graduation.

4.4 Discussion

Industrial design departments in public universities are vested with the responsibility of production of graphic designers for Nigeria's graphic design industry.The print-based graphic design is undeniably a vital aspect of the students' developmental process as a graphic designer. 90% of the respondents strongly agree with this statement,the result of the study has shown that, the design facilities and equipment in the public universities as

were revealed were not sufficient to support a developmentally oriented curriculum. Students on graduation from the public universities don not have confidence in their level of preparedness to take on responsibilities in the real world of printing. The study revealed that 56% of student respondents would be able to demonstrate managerial proficiency on print-based graphic design, but 48% would not be able demonstrate technical proficiency on the other hand.This is in conformity with Ogunduyile&Akinbogun, (2006) when they observe that many chances of the industrial designers functioning effectively are being limited by many factors.

Opinions were that students on graduation should be able to demonstrate both managerial and technical proficiency in print-based graphic design. This cannot be supported by the limited facilities in the universities, which focus on what is most important for students learning and yet the trends of technological development in the print-based graphic design profession are not taught through practical demonstration in these schools. It is expected that there should be planning and management in adopting technology, for the public universities to move with the trends of technological development in the graphic design field. Therefore, the universities should assume the leadership role to both the students and the design Industies by adopting a system, this is supported by Afolabi (2014) who posits that, there is an urgent need to ensure that training opportunities in Nigeria's graphic design schools meet up with industry needs." Interestingly, from the opinions as revealed, the state of these facilities is not the physical representation of the standard educational vision in Nigeria.

Professionals in the print-based graphic design industries and the universities have not yet develop a network of sharing best practices, learn about new approaches and share new innovations and technology. By implication, those responsible for planning in the universities need to understand the relationship between the universities and print-based graphic design industries in Nigeria. This will fast track the development of sound comparable performance indicators and benchmarking system between schools and print-based graphic design industries in Nigeria. A common forum, cordial relationship and supporting umbrella should be developed, this will bring both party together on how they would improve the industry. Similarly, Raver (2012) notes that it is essential to have industry-university interactions which will help to impart relevant knowledge and will be sustainable in the changing conditions. Universities and professionals in the graphic design industries should take the initiative of jointly organising seminars/workshops in support of the print-based graphic design field.

Universities and print-based graphic design industries have a responsibility to give students a better learning plateform that will enhance their developmental process as graphic designers it was gathered that industries were more current in terms of equipment and technological development in the printing. It was also observed that some universities own printing establishments are operating in isolation from the industrial design depts of universities. The schools should take advantage of such units , by including them as part of the learning programme that will expose their students to modern equipment, machines,technique and technology in the printing design that will enhance both managerial and technical proficiency of the students. The institutions credibility also

depends upon the market up take of their trained students, who on graduation should have arcquired marketable skills that will make them to be employable. “It is more evident in our present setting when our schools face a notable shift in emphasis in terms of curriculum and aims, leaving a deficit on professional and industry skills, which will be blamed on a lack of interaction between industry and universities”.AIGA (2014) argued that academic programs should be connected to the region's businesses through the Graphic design internship program; and to the region's professional design community through a close association with the national professional organizations.

Ololube (2006) observes that government everywhere in the world especially in emeging economies are to encourage their citizen to arcquire the skill of entrepreneurship. This will make them to be better participants in evolving the economy of the society they live in. From the finding of this research, it indicates that sixty-six percent of the finial year students were of the opinion of venturing into print-based graphic design enterprise after graduation. This is a considerable stride in the understanding of the impact of print-based graphic design facilities in public universities in Nigeria, towards producing a new caliber of students whose professional ability are very essential in a developing economy.

4.5 Comparing pictures of printing facilities in the universities and printing industry in Nigeria.

The picture on plate V is of the Typography proofing machine in ABU, Zaria.The machine was very vital in the letter press printing technology, it can not meet need of the time anymore. The machine is not in use at the moment, except for historical purposes. Plate VI: Herold Gulletin Machine. ABU, Zaria as we can see is a small Gulletin Machine

for cutting of papers into different sizes. Plate VII: is the Etching machine, plate VIII: Board Chopper and plate IX: Albion press machine. ABU, Zaria. These are manually operated machines use in performing different printing tasks. Plate X is the Type Bank. ABU, Zaria. Types are kept in the Type Bank, the functionality of the Type bank has been reduced to a mere box, as a result of the obsolete nature of the letter press printing technology. Plate XII: Heidelberg Typography printing machine. ABU, Zaria. This machine was used for Typography printing. Plate XIII: Multilith Offset model 1850 printing machine and plate XIV: Gulletin "28". ATBU, Bauchi. The Offset uses film plate or lithography technology for printing. The machine above can only print on A4 paper size and below. A bigger Gulletin machine is seen here for cutting and tremming of papers into sizes.

Plate XV: Heat press machine and digital printing machine. ATBU, Bauchi. The Heat press and digital printing machines are complimentray set of machines, where by designed images are sent from the computer to the digital printer to print images in mirrored form, after which Heat press is empolyed to transfer the images on the surface T-shirt and face-caps especially. Plate XVl: Dupliphot HS 130 Lithography Developer in ATBU ATIL printing Press, Bauchi. Plate XXI: Film developing machine in ABTI Press, Yola. These machines are primarily used for the development of Lithography and Film for onward production. Plate XVIII: Direct image printer in Excell Global printers, Kaduna, the Direct image printer can print large amount of design in a very short interval, if the designer so wish each design can vary from the last one printed. The machine can print as large as A3 paper size.

Plate XIX: UV Flatbed Printer in Signal 7000, Akure. The UV flatbed is a portable machine that is designed to print on T-shirt with full colours. Plate XX: Flex Banner and SAV (Self adhesive vinyls) Printer in Flamingos Digital Prints, Akure. This machine can be used to print the following; banners, stickers and rollups, vehicle wraps, truckside and branding materials. The printing technological trend is now centred around this technology. which can be clearly seen on the graphic design student's assignment, ranging from packaging to poster/advertisement designs. Plate XXIII: Print Master 74 ABTI Press, Yola. 2 colours offset press, large sheet 530 by 740mm (20.87 by 29.13 in) Smallest sheet for perfecting jobs 300 × 280 mm (11.81 × 11.02 in) Press speed Maximum 12000 sheets/h Minimum 3000 sheets/h.

4.6 Pictures of Machines in some public universities and selected print base graphic design companies in Nigeria.



Plate V: Typography proofing machine. ABU, Zaria.
Source: Original photograph by Maxwell E. Roberts, 2016.



Plate VI: Herold Gulletin Machine. ABU, Zaria.
Source: Original photograph by Maxwell E. Roberts, 2016.

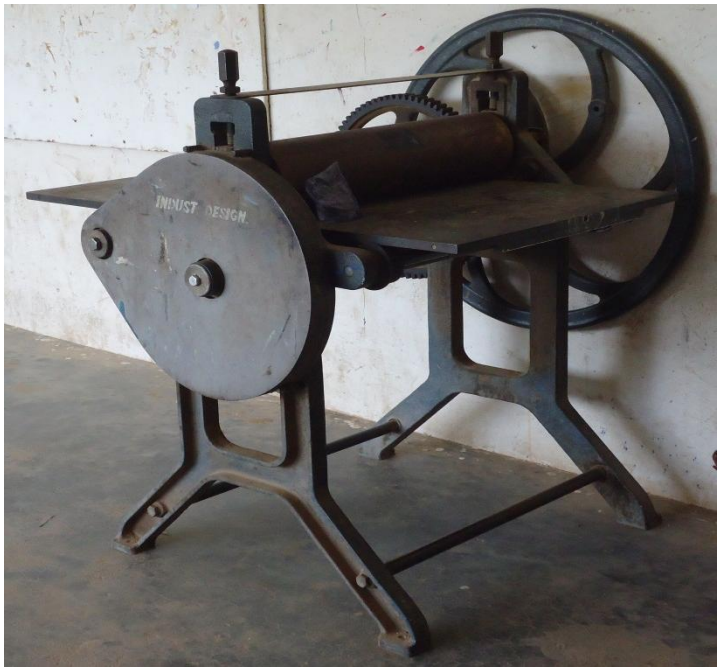


Plate VII: Etching machine. ABU, Zaria.
Source: Original photograph by Maxwell E. Roberts, 2016.



Plate VIII: Board Chopper. ABU, Zaria.
Source: Original photograph by Maxwell E. Roberts, 2016.



Plate IX: Albion Press Machine. ABU, Zaria.
Source: Original photograph by Maxwell E. Roberts, 2016.



Plate X: Type Bank. ABU, Zaria.
Source: Original photograph by Maxwell E. Roberts, 2016.



Plate XI: Heidelberg Typography Printing Machine. ABU, Zaria. (Side view)
Source: Original photograph by Maxwell E. Roberts, 2016.



Plate XII: Heidelberg Typography Printing Machine. ABU, Zaria.
Source: Original photograph by Maxwell E. Roberts, 2016.



Plate XIII: Multilith Offset model 1850 Printing Machine. ATBU, Bauchi.
Source: Original photograph by Maxwell E. Roberts, 2016.



Plate XIV: Gulletin "28". ATBU, Bauchi.
Source: Original photograph by Maxwell E. Roberts, 2016.



Plate XV: Heat press Machine and Printing Machine. ATBU, Bauchi.
Source: Original photograph by Maxwell E. Roberts, 2016.



Plate XVl: Dupliphot HS 130 Lithography Developer. ATBU ATIL printing Press, Bauchi. Source: Original photograph by Maxwell E. Roberts, 2016.



Plate XVII: Stahlfolder Machine ABTI Press, Yola.
Source: Original photograph by Maxwell E. Roberts, 2016.



Plate XVIII: Direct Image Printer. Excell Global printers, Kaduna.
Source: Original photograph by Maxwell E. Roberts, 2016.



Plate XIX: UV Flatbed Printer Signal 7000, Akure.
Source: Original photograph by Maxwell E. Roberts, 2016.



Plate XX: Flex Banner Printer. Flamingos Digital Prints, Akure.
Source: Original photograph by Maxwell E. Roberts, 2016.



Plate XXI: Film developing Machine ABTI Press, Yola.
Source: Original photograph by Maxwell E. Roberts, 2016.



Plate XXII: GTO Print Master ABTI Press, Yola.
Source: Original photograph by Maxwell E. Roberts, 2016.



Plate XXIII: Print Master 74 ABTI Press, Yola.
Source: Original photograph by Maxwell E. Roberts, 2016.



Plate XXIV: Film Processor ABTI Press, Yola.
Source: Original photograph by Maxwell E. Roberts, 2016.



Plate XXV: Quick setter ABTI Press, Yola.
Source: Original photograph by Maxwell E. Roberts, 2016.



Plate XXVI: Graphic designer ABTI Press, Yola.
Source: Original photograph by Maxwell E. Roberts, 2016.



Plate XXVII: The researcher and the graphic designer ABTI Press, Yola.
Source: Original photograph by Maxwell E. Roberts, 2016.

CHAPTER FIVE
SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

The vital goal of the inclusion of printing into the undergraduate programme in universities, is to prepare students rightly with the use of printing facilities for graphic design practices, this could only be effective when students are provided with applicable skills and appropriate understanding through constant review of its programme in accordance with current trend of information technology by essential facilities and personnel that are akin to what is obtained globally.

The objective of this study stemmedfrom the background of the problem and supported by relevant literature that largely referenced theories, stages of production in printing, various technologies in printing and relationship between university and industry reveal how collaboration can be enhanced. The study used descriptive method to explain its content, Pilot test was carried out in Ahmadu Bello Universty, Zaria to ascertain the validity of the problem raised by the researcher.

Four states were visitedin Nigeria in the course of the study;samples were collected from four federal universities and eight companies that were selected using purposive sampling technique. The data retrieved from the field were analyzed using statistical tables to represent percentages and frequencies in a precise way. It was found that the facilities in the universities were obsolete, not too relevant for learning and teaching.Furthermore the level of collaboration between the university and the print design industry need to be improved to safeguard students' employability at graduation.

5.2 Conclusion

The indication evident from this study is in line with Robert (1991) and Olaniyan&Okemakinde, (2008) view when they made clear that education is a tool for improving human capital, stimulating labour productivity and boosting the levels of technology across the globe. Therefore, designing and implementing successful Technological-enabled education programme is the key to fundamental, wide-ranging educational reforms. Consequently, Industrial Design institutions in Nigeria should either assume a leadership role in the transformation of education or be left behind in the swirl of rapid technological changes. According to Iyang (2017) evolving technology should not be taken for granted by Nigeria universities. Accordingly, for Nigerian education to reap the full benefits of Technology in learning, it is essential that undergraduates and graduates are able to effectively use these facilities for learning. This research endeavour might have made a considerable stride in the understanding of the impact of Print based graphic design facilities in public universities in Nigeria towards producing a new caliber of students whose professional ability are very essential in a developing economy.

5.3 Recommendations

Recommendations are primarily grounded on findings of the study they are likewise comparatively established on scholar's involvements and annotations on the prevailing situation of data gathering.

5.3.1 Recommendations for Future Research

The succeeding recommendations are made for the attention of future research, government and authorities in charge of procurement of learning facilities in public universities in Nigeria.

(1) Related research could be conducted to find out the usage and integration of print based graphic design facilities in Industrial Design programme in the Polytechnic level in Nigeria.

(2) The results and findings of this study could further be developed as a conceptual framework for the development of a model for integrated graphic design curriculum for Nigeria universities.

5.3.2 General Recommendations

From the findings of this study, the following recommendations were made;

(1) On the basis of the current need and increasing emphasis placed on the public world of Graphic communication, since change is imperative; Nigerian universities should re-invent themselves to provide the skills needed for a new generation of Graphic design professionals.

(2) It is more evident now in the educational setting, that schools face notable shift in emphasis in terms of curriculum and aims, leaving a deficit on professional and industry skills, which will be blamed on a lack of interaction between industry and university. Hence it is essential to have mechanism (like collaboration in terms of workshops and

roundtables) that will foster the relationship between university and industry which will help to impart relevant knowledge and will be sustainable in the changing conditions.

(3) Institutions and Industrial Design programme must provide the leadership for students and industries and model the new pedagogies and tools for learning through effective strategic plan. However, a successful and effective strategic plan depends to the extent to which proper implementation and monitoring are carried out.

(4) University's credibility also depends upon the market up take of their trained students; therefore,Universities should establish spin-off companies working collaboratively with the university to create opportunities for placements of students, during and after graduation.

5.4 Contribution to knowledge

- This study has established that productive and functional graphic to skills can only be acquired in an instructional environment, where state-of the-art design and printing facilities are available for instructional purposes.
- This study has established that in an instructional environment were print based facilities are not available or obsolete, collaborative effort between the industry and institutions is the best option.

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Appendix 1:

Location of selected Universities with Industrial Design Department

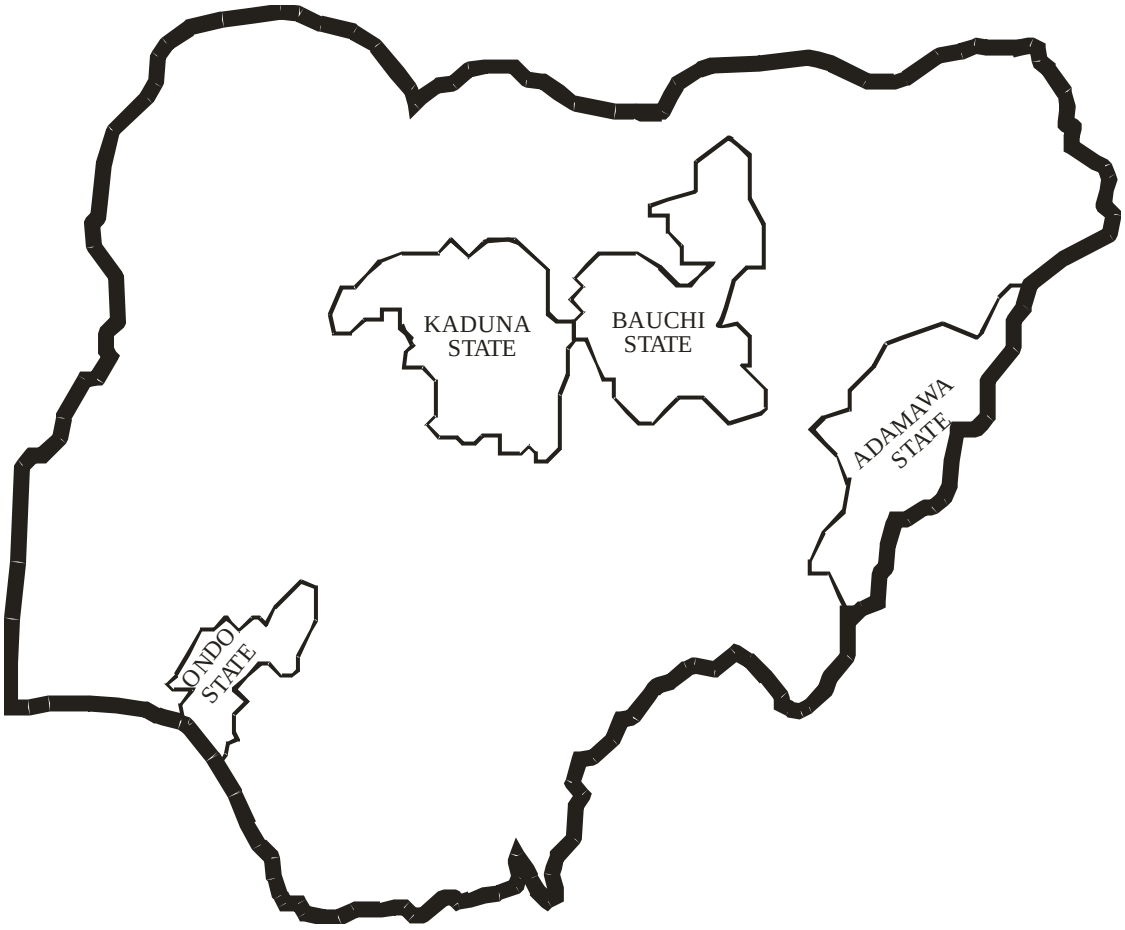


figure:1

Appendix 2:

AHMADU BELLO UNIVERSITY, ZARIA, DEPARTMENT OF INDUSTRIAL DESIGN

QUESTIONNAIRE FOR GRAPHIC DESIGN LECTURERS

"Comparative study of print based graphic design facilities in public universities and in graphic design industries in Nigeria"

Dear Respondent,

I am a postgraduate student of Graphic Design section, of the Department of Industrial Design, Ahmadu Bello University, Zaria. This questionnaire is partial fulfillment of a research towards the award of an M.A. Degree in Industrial Design. The questionnaire is designed to elicit responses on the topic **"Comparative study of print based graphic design facilities in public universities and in graphic design industries in Nigeria"** All information given will be treated confidentially and use for the purpose of this study.

SECTION A

Biodata

Instruction: *Fill and tick in the appropriate responses*

1. **Name of institution:** ……
2. **Gender:** Male ☐ Female ☐
3. **Age:** 20-29 ☐ 30-39 ☐ 40 – 49 ☐ 50 and above ☐

4. **Marital Status:** Married ☐ Single

5. **Highest Educational Qualification:** Doctorate ☐ Master ☐ Bachelor ☐

6. **How many years have you been employed by the university:** 0-5 ☐ 6 -10 ☐ 11-15 ☐ 6 and above ☐

7. **What best describes how you currently serve the student population of this institution?**

Teacher ☐ Administrator/Counselor ☐ Others ☐

SECTION B

Are design graduates of Nigerian public universities well trained to fit into production line on graduation?

Instruction: *Answer all questions. Choose only the most appropriate option by placing a tick [ ] on it.*

Key: SA=Strongly Agree, A=Agree, U=Undecided, D=Disagree, SD=Strongly Disagree

8.	The (print based) graphic design is a vital aspect of the students' developmental process as graphic designer.	**SA**	**A**	**U**	**D**	**SD**
9.	Students on graduation should be able to demonstrate managerial proficiency on (print based) graphic design.					
10.	On graduation students should be able to demonstrate technical proficiency on (print based) graphic design.					
11.	The (print based) graphic design facilities in my institution, contribute to a shared sense of purpose.					
12.	In my institution, the (print based) graphic design facilities focus on what is most important for students.					
13.	The (print based) design facilities in my institution are physical representation of the standard educational vision in Nigeria.					
14.	Public universities are expected to move with the trend of technological development in the (print based) graphic design profession.					
15.	There is planning and management; in adopting technology in a faster and more proactive way in the public universities.					
16.	Students in my institution are taught with the latest technology in the (print based) graphic design profession.					
17.	In my institution Students learn through practical demonstration of the latest technology in the (print based) graphic design field.					
18.	The (print based) graphic design facilities in my institution meet the needs of department, staff, and students.					
19.	In my institution there is a printing press that belongs to the institution.					
20.	Students often go to the printing press for practical demonstration.					
21.	Public universities do not have a detailed understanding of the needs of the (print based) graphic design industry. (Students' quality).					
22.	My institution has a detailed understanding of the new challenges brought					

	by the paradigm shift in the print based industry.					
23.	With the knowledge/skills acquired from my institution, graduates can transit smoothly into the world of (print based) graphic design					
24.	Graduates of my institution are equipped to take on responsibilities in the real world of (print based) graphic design.					
25.	On graduation, graduates of my institution, must have acquired the knowledge/skills to become an entrepreneur in the (print based) graphic design industry.					
26.	Public universities have met the manpower development needs in an ever-evolving high-tech driven (print based) graphic design industry.					
27.	Graduates need re-training/internship programme to be able to function properly in the (print based) graphic design industry.					
28.	Acquiring these (print based) graphic design facilities required a detailed understanding of the relationships between universities and the need of the (print based) graphic design industry.					
29.	More is expected from relevant authorities in terms of printing facilities in Nigeria's public universities					
30.	There is need to identify innovative models for financing (print based) graphic design facilities in public universities in Nigeria.					

Appendix: 3

AHMADU BELLO UNIVERSITY, ZARIA, DEPARTMENT OF INDUSTRIAL DESIGN

QUESTIONNAIRE FOR GRAPHIC DESIGN STUDENTS

"Comparative study of print based graphic design facilities in public universities and in graphic design industries in Nigeria"

Dear Respondent,

I am a postgraduate student of Graphic Design section, of the Department of Industrial Design, Ahmadu Bello University, Zaria. This questionnaire is partial fulfillment of a research towards the award of an M.A. Degree in Industrial Design. The questionnaire is designed to elicit responses on the topic **"Comparative study of print based graphic design facilities in public universities and in graphic design industries in Nigeria"** All information given will be treated confidentially and use for the purpose of this study.

SECTION A

Biodata

Instruction: *Fill and tick in the appropriate responses*

1. Name of institution: …….

2. **Gender:** Male ☐ Female ☐

3. Age: 15-19 ☐ 20-24 ☐ 25 – 29 ☐ 30 and above ☐

4. Marital Status: Married ☐ Single ☐

5. Highest Educational Qualification: WAESC ☐ OND ☐ HND ☐ NCE ☐

6. Years of Course at the University: 4 ☐ 5 ☐

SECTION B

The adequacy, relevancy and your exposure to the use of (print based) graphic design facilities in your own Institution.

Instruction: *Answer all questions. Choose only the most appropriate option by placing a tick [ ] on it.*

Key: SA=Strongly Agree, A=Agree, U=Undecided, D=Disagree, SD=Strongly Disagree

		SA	A	U	D	SD
7.	My institution has sufficient equipment to support a developmentally oriented curriculum.					
8.	The (print based) graphic design is a vital aspect of my developmental process as a graphic designer.					
9.	The (print based) design facilities in my institution meet the needs of students.					
10.	The (print based) design facilities in my institution meet the needs of lecturers.					
11.	The design facilities in my institution meet the needs of (print based) graphic design industry.					
12.	My institution is focus on what is most important for students, In terms of (print based) graphic design.					
13.	Public universities are expected to move with the trend of technological development in the (print based) graphic design profession.					
14.	My institution is moving with the trend of technological development in the (print based) graphic design profession.					
15.	Students in my institution are taught with the latest technology in the (print based) graphic design profession.					

16.	In my institution students learn through practical demonstration with the latest technology in the (print based) graphic design field.					
17.	As a class we have had the privilege of visiting a print based graphic design firm.					
18.	In my institution there is a printing press that belongs to the institution.					
19.	Students often go to the institution's printing press for practical demonstration.					
20.	Graphic design (print based) industries are current in terms of technological development in the profession.					
21.	The universities have to plan and manage; in adopting technology in a faster and more proactive way.					
22.	With the practical knowledge I have acquired from my institution, on graduation i should be able to demonstrate technical proficiency on (print based) graphic design.					
23.	On graduation, from my institution with the knowledge I have acquired, I will be equipped to take on responsibilities in the real world of (print based) graphic design.					
24.	On graduation, from my institution, with the knowledge/skills i have acquired in the (print based) graphic design, i can become an entrepreneur in the (print based) graphic design industry.					
25.	Graduates need re-training/internship programme to be able to function properly in the (print based) graphic design industry.					

Appendix: 4

AHMADU BELLO UNIVERSITY, ZARIA, DEPARTMENT OF INDUSTRIAL DESIGN

QUESTIONNAIRE FOR GRAPHIC DESIGN (PRINT BASED) INDUSTRY'S SUPERVISORS

"Comparative study of print based graphic design facilities in public universities and in graphic design industries in Nigeria"

Dear Respondent,

I am a postgraduate student of Graphic Design section, of the Department of Industrial Design, Ahmadu Bello University, Zaria. This questionnaire is partial fulfillment of a research towards the award of an M.A. Degree in Industrial Design. The questionnaire is designed to elicit responses on the topic **"Comparative study of print based graphic design facilities in public universities and in graphic design industries in Nigeria"** All information given will be treated confidentially and use for the purpose of this study.

SECTION A

Biodata

Instruction: *Fill and tick in the appropriate responses*

1. Name of organisation: ……

2. Gender: Male ☐ Female ☐

3. Age: 20-29 ☐ 30-39 ☐ 40 – 49 ☐ 50 and above ☐

4. Marital Status: Married ☐ Single ☐

5. Highest Educational Qualification: Doctorate ☐ Master ☐ Bachelor ☐ HND ☐

6. **How many years have you been employed by this organization:** 0-5 ☐ 6–10 ☐ 11-15 ☐

   16 and above ☐

7. **What best describes how you currently serve the student population of this organsation?**

   Supervisor ☐ Administrator/Counselor ☐ Others ☐

Instruction: *Answer all questions. Choose only the most appropriate option by placing a tick [ ] on it.*

Key: SA=Strongly Agree, A=Agree, U=Undecided, D=Disagree, SD=Strongly Disagree

SECTION B

"What is the level of collaboration between (print based) graphic design industries and public universities in Nigeria?

		SA	A	U	D	SD
8.	Professionals in the (print based) graphic design, both the universities and the industries have not yet developed a network to share best practices.					
9.	Professionals in the (print based) graphic design, both the universities and the industries have not yet developed a network to learn about new approaches.					
10.	Universities and professionals in the (print based) graphic design industries share new innovations, technology and practice.					
11.	Those responsible for planning in the universities understood the relationships between universities and (print based) graphic design industries in Nigeria.					
12.	There is a developed sound comparable performance indicators and benchmarking systems between universities and (print based) graphic design Industries in Nigeria.					
13.	Professionals and universities in the (print based) graphic design field have a common forum and supporting umbrella that brings them together.					

14.	Universities and professionals in the (print based) graphic design industries enjoy cordial relationship, on how they would improve the industry.					
15.	Seminars/workshops are “seed” initiative which may eventually evolve into a periodic forum and a supporting organisation.					
16.	Universities and professionals in the graphic design industries take the initiative of jointly organising seminars/workshops in support of the (print based) graphic design field.					

Appendix: 5

AHMADU BELLO UNIVERSITY, ZARIA, DEPARTMENT OF INDUSTRIAL DESIGN

QUESTIONNAIRE FOR GRAPHIC DESIGN GRADUATES WORKING WITH (PRINT BASED) DESIGN INDUSTRY

"Comparative study of print based graphic design facilities in public universities and in graphic design industries in Nigeria"

Dear Respondent,

I am a postgraduate student of Graphic Design section, of the Department of Industrial Design, Ahmadu Bello University, Zaria. This questionnaire is partial fulfillment of a research towards the award of an M.A. Degree in Industrial Design. The questionnaire is designed to elicit responses on the topic **"Comparative study of print based graphic design facilities in public universities and in graphic design industries in Nigeria"** All information given will be treated confidentially and use for the purpose of this study.

SECTION A

Biodata

Instruction: *Fill and tick in the appropriate responses*

1. Name of organisation: ……

2. Gender: Male ☐ Female ☐

3. Age: 20-29 ☐ 30-39 ☐ 40 – 49 ☐ 50 and above ☐

4. Marital Status: Married ☐ Single ☐

5. Highest Educational Qualification: Doctorate ☐ Master ☐ Bachelor ☐

6. How many years have you been employed by this organization: 0-5 ☐ 6–10 ☐ 11-15 ☐ 16 and above ☐

7. What best describes how you currently serve the student population of this organsation?

Supervisor ☐ Administrator/Counselor ☐ Others ☐

Instruction: *Answer all questions. Choose only the most appropriate option by placing a tick [ ] on it.*

Key: SA=Strongly Agree, A=Agree, U=Undecided, D=Disagree, SD=Strongly Disagree

SECTION B

To what extent is the gap between teaching facilities in public universitiesand the (print based) graphic design industry in Nigeria?

		SA	A	U	D	SD
8.	The universities and (print based) graphic design industries have a share sense of responsibility for students learning.					
9.	Public universities have sufficient space and storage to support a developmentally oriented curriculum.					
10.	Public universities have sufficient equipment to support a developmentally oriented curriculum.					
11.	The (print based) graphic design facilities in the public universities meet the needs of students.					
12.	The (print based) graphic design facilities in the public universities meet the needs of lecturers'.					
13.	The (print based) graphic design facilities in the public universities meet the needs of graphic design based industries.					
14.	Design based industries are well equipped in term of (print based) graphic					

	design facilities.					
15.	Graphic design (print based) industries are more current in terms of technological development in the field.					
16.	Graduates of the public universities are equipped to take on responsibilities in the real world of (print based) graphic design.					
17.	On graduation from the public universities, graduates are able to demonstrate managerial proficiency on (print based) graphic design.					
18.	On graduation from the public universities, graduates are able to demonstrate technical proficiency on (print based) graphic design.					
19.	With my experience in the (print based) graphic design industry, I can become an entrepreneur in the graphic design industry.					
20.	I acquired the knowledge/skills of becoming an entrepreneur in the (print based) graphic design industry, On graduation, from my institution.					
21.	Graduates need re-training/internship programme to be able to function properly in the (print based) graphic design industry.					

Appendix: 6

Letter of Introduction



DEPARTMENT OF INDUSTRIAL DESIGN

AHMADU BELLO UNIVERSITY, ZARIA - NIGERIA

Vice Chancellor: Professor Ibrahim Garba , B.Sc. (Hons) Geology (A.B.U.),M.Sc Mineral Expiration ABU, Ph.D (Geology) London. Diploma of the Imeria College London

Head of Department: Dr. Vershima Alkali, BA, MA Ph.D (ABU) SNA, CPAN, CeRAN

08034531720
08021155799

Date:.....

.....

.....

.....

.....

Dear Sir/Madam,

INTRODUCTION LETTER IN RESPECT OF: MAXWELL ESHIWHOBE ROBERTS

The above mention student with ***Reg. No.*** **P14EVID8016** is a Postgraduate Student from the above named Department of Ahmadu Bello University Zaria. He is undertaking a research title: "***Comparative Study of Print Based Graphic Design Facilities in Public Universities and in Graphic Design Industries in Nigeria***".

Your kind co-operation, support and assistance in providing any useful information and materials for the success of this study will be appreciated. All information provided will be regarded only for the purpose of this research and treated as confidential.

Thank you.

Yours faithfully,

Mal. Aliyu Umar
For: Head of Department

SECTIONS: •Ceramics • Graphics •Textiles •Glass Technology